

U.S. Army service schools, Fort Leavenworth

VOLUME XVII
1937

Number 64

005491

THE

COMMAND AND GENERAL STAFF SCHOOL QUARTERLY

REVIEW OF MILITARY LITERATURE

MAJOR FRED DURING, *Editor*
MAJOR G. J. BRAUN, *Assistant Editor*

FOREWORD

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a Section of "Abstracts of Foreign-language Articles."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This Quarterly is published as a guide to modern military tendencies and to inspire vigorous thought on the subjects treated.

The opinions expressed by authors are not necessarily official.

March, 1937

First Quarter

PROPERTY
OF
AIR FORCES LIBRARY
WASHINGTON, D. C.

THE COMMAND AND GENERAL STAFF SCHOOL QUARTERLY—REVIEW OF MILITARY LITERATURE, is published by The Command and General Staff School at Fort Leavenworth, Kansas. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rate: One year in the United States and possessions, Cuba and Mexico, \$1.00; foreign, \$2.00 a year.

124760
PROPERTY OF U. S.

Periodical
Section /

Vol

Sec

Sec

Sec

Sec

Sec

Sec

Sec

016.355

Un3r

v. 17

THE COMMAND AND GENERAL STAFF SCHOOL QUARTERLY

Review of Military Literature

Volume XVII

March, 1937

Number 64

CONTENTS

	Page
Section 1—ORIGINAL MILITARY STUDY	5
Section 2—ABSTRACTS OF FOREIGN-LANGUAGE ARTICLES	27
This Section contains abstracts of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Section 4.	
Section 3—DIRECTORY OF PERIODICALS	95
A guide to Section 4 and Section 7.	
Section 4—CATALOG OF SELECTED PERIODICAL ARTICLES	97
A systematic review of the contents of selected military periodicals. Foreign-language periodicals are digested to a degree to furnish an adequate idea of contents and significance.	
Section 5—ACADEMIC NOTES, C. & G.S.S.	155
Reprint of current School material, which affects instructional procedure or tactical doctrines.	
Section 6—LIBRARY BULLETIN	281
This Section lists books, recently accessioned, which are of particular significance.	
Section 7—READERS' GUIDE AND SUBJECT INDEX	285
All subject-headings are arranged in alphabetic sequence and can be consulted like a dictionary. Note also List of Periodicals Indexed and Key to Abbreviations.	

THE COMMAND AND GENERAL STAFF SCHOOL PRESS
FORT LEAVENWORTH, KANSAS

782-3-31-37-3M

12446

LIST OF CONTRIBUTORS

	A	B	C	D
Braly, Capt. W.C.				1
Braun, Maj. G.J.	1		2	
Brereton, Lt.Col. L.H.	1			
Bullard, Lt.Col. P.C.	1			
During, Maj. F.	3	27	3	
Heidner, Lt.Col. S.J.	1		2	
Johnson, Capt. W.G.	1			
Koenig, Maj. E.F.	1		3	
Moore, Maj. C.R.	1			
Phillips, Maj. T.R.	1		1	
Tindall, Maj. R.G.	2			
Truscott, Maj. L.K., Jr.	1			

A—Foreign-language Periodicals; B—English-language Periodicals;
C—Abstracts of Foreign-language Articles; D—Original Study.

- Maj. G.J. Braun: *Wissen und Wehr* (July, August, September 1936).
Lt.Col. L.H. Brereton: *Revue de l'Armée de l'Air* (July, August, September 1936).
Lt.Col. P.C. Bullard: *Revue du Génie Militaire* (July-August, September-October 1936).
Maj. F. During: *Militärwissenschaftliche Mitteilungen* (July, August, September 1936); *Pioniere* (August 1936); *Rivista di Artiglieria e Genio* (June, July-August 1936).
Lt.Col. S.J. Heidner: *Sanct Christophorus* (July, August, September 1936).
Capt. W.G. Johnson: *Bulletin Belge des Sciences Militaires* (July, August, September 1936).
Maj. E.F. Koenig: *Militär-Wochenblatt* (18 August-11 November 1936).
Maj. C.R. Moore: *Revue Militaire Française* (July, August, September 1936).
Maj. T.R. Phillips: *Revue Militaire Suisse* (June, July, August 1936).
Maj. R.G. Tindall: *Revue d'Artillerie* (July, August, September 1936); *Revue d'Infanterie* (July, August, September 1936).
Maj. L.K. Truscott, Jr.: *Revue de Cavalerie* (May-June, July-August 1936).

Section 1
ORIGINAL MILITARY STUDY

THE INFLUENCE OF SUPPLY ON STRATEGY

By Captain William C. Braly, Coast Artillery Corps

INTRODUCTION

An examination of the definitions of strategy in war, as stated by twenty-eight different authorities, discloses two things:

First: That they are all different.

Second: That there has been a gradual development of the meaning of strategy from the narrower early Greek interpretation as "the art of the general," to a much broader conception at the present time. While contemporary writers disagree as to the aim and scope of strategy and its relation to national policy, I believe Maurice expresses the general thought as it has developed since the World War in his work entitled *British Strategy*, published in 1929. He states, "Strategy should be defined . . . as the art of applying national power to achieve the object of war."

He then breaks national power down into its several components such as diplomacy, financial or economic resources, *i.e.*, supply, and, of course, the armed forces.

In the realm of supply I include, for the armed forces, the provision and distribution of food, munitions and the vast requirements of stores, with the necessary transportation systems and lines of communication connecting with bases of supply. For the nation supporting the armed forces, supply means wealth, resources, freedom of the seas, world markets or any term that implies economic advantage.

In this discussion I propose to examine certain events in military history noting the effect of the observance or lack of observance of proper supply considerations on the strategy and success of the operation.

If, throughout the ages under diverse conditions, certain causes produced similar effects, we may logically draw reasonable conclusions pertaining to the theory of war and possibly suggest certain future lines of action. My examples will be drawn from various important struggles in world history from the fifth century, B. C., through 1918.

HISTORICAL DISCUSSION

When we consider the difficulties experienced during the World War in supplying large forces in the Near East we marvel the more at the magnitude of the operation carried out by Xerxes, King of Persia, in his great invasion of Greece in 481 B. C.

In preparation he collected provisions, wagons and animals, established magazines of stores echeloned along his route of approach, and fitted out a navy of some 750 vessels plus ponton equipment for 2 bridges across the Hellespont. When all was ready he advanced with a force stated by Herodotus as a "vast multitude of men," previous expeditions "appearing as nothing compared to this."

Certain of his engineers seem to have been *persona non grata* at one stage of the proceedings, for Herodotus further relates the following incident after the first bridging of the Hellespont:

"When the strait was thus united, a violent storm arising, broke in pieces and scattered the whole work. When Xerxes heard of this, being exceedingly indignant, he commanded that the Hellespont should be stricken with three hundred lashes with a scourge, and that a pair of fetters should be let down into the sea. I have moreover heard that with them he likewise sent branding instruments to brand the Hellespont. He certainly charged those who flogged the waters to utter these barbarous and impious words: 'Thou bitter water! thy master inflicts this punishment upon thee, because thou hast injured him, although thou hadst not suffered any harm from him. And King Xerxes will cross over thee, whether thou wilt or not; it is with justice that no man sacrifices to thee, because thou art both a deceitful and briny river!' He accordingly commanded them to chastise the sea in this manner, and to cut off the heads of those who had to superintend the joining of the Hellespont. They on whom this thankless office was

imposed, carried it into execution; and other engineers constructed bridges: and they constructed them in the following manner . . ."

The fleet carried the bulk of his supplies, but an orderly system of requisition levied on territory passed through saved the stores in his trains for future use and the army reached Greece in fine condition. However, Greek strategy was equal to the occasion. By a ruse the Persian fleet was drawn into the narrow straits between the islands of Salamis and the mainland where their superiority of numbers was discounted and was decisively defeated by the Greek fleet while the Persian army helplessly saw their vast supplies destroyed. Their retirement followed immediately.

In 251 B. C. there were two normal routes (eastern and western) by which Hannibal, then master of northern Italy, could advance on Rome. The Roman consuls had placed their armies astride these routes. Hearing of a shorter approach which, however, led through the marshes, Hannibal decided on this route rather than meet the Romans on ground of their own choosing. By forced marches he advanced his army southward and was well in rear of the eastern Roman army, accumulating supplies and devastating the country, when its commander, the consul Flaminius became aware of the situation and started in hot pursuit. At Lake Trasimene, Hannibal laid the greatest ambush in history, struck the Romans in front and rear and annihilated them. His strategy of indirect approach to the enemy's lines of communication succeeded where a frontal attack would have been hazardous to say the least.

Mongol strategy as exemplified by Genghis Khan and Sabutai in the thirteenth century showed a distinct appreciation of supply considerations both in preparing for their own necessities and in seeking decisive victory by cutting the enemy's communications.

In the year 1220, Genghis Khan, moving westward into Turkestan, had a distracting force approach Bokhara from the south. Then his main army appeared from the north. Screened by its operations, he swung wider still with his reserve army and disappeared into the desert of Kizyl-Kum to emerge later by surprise in rear of the enemy defensive lines and astride his communications. Bokhara thus fell to his strategy. Twenty years later his great general, Sabutai, found himself facing an army of 100,000 Hungarians across the Danube. By a skill-

fully executed strategic retirement toward his base he lured the Hungarians across the Danube away from their sources of supply—then by a swift night maneuver he interposed his army between his enemy and the Danube, fell on their rear at daylight, and by noon the Hungarian army had ceased to exist.

In the seventeenth century, Cromwell, thoroughly imbued with the strategic advantage of shutting off his enemy's supplies achieved decisive successes at Preston Moore, Dunbar and Worcester by such a maneuver.

Examples can be cited from the campaigns of Gustavus Adolphus, Marlborough and Frederick the Great which indicate a keen appreciation by these great commanders of the relation of supply and strategy. However, more modern examples appear to hold greater interest.

Coming down to our own Revolutionary War, it will be remembered that the British were forced to maintain their armed forces in hostile territory across the Atlantic Ocean. In 1781 their armies in the colonies were divided, a part being in New York under Clinton, a part in the Carolinas under Cornwallis and another detachment in Virginia. In the early summer of 1781 Cornwallis moved his command northward and joined the Virginia force, making a combined British strength of about 7,000 men. Having been directed by Clinton to establish a base for the protection of British cruisers he selected Yorktown, on the York River, an arm of Chesapeake Bay, and began fortifying the place. It was there that Washington and our French allies besieged him in September; but when the superior French fleet, under Admiral de Grasse, arrived a month later from the West Indies and bottled up the British ships in the river, Cornwallis' fate was sealed. Being unable to obtain supplies or reinforcements, he surrendered on 19 October.

Any review of military history, however brief, would be incomplete without considering Napoleon's experiences and his handling of the subject in question.

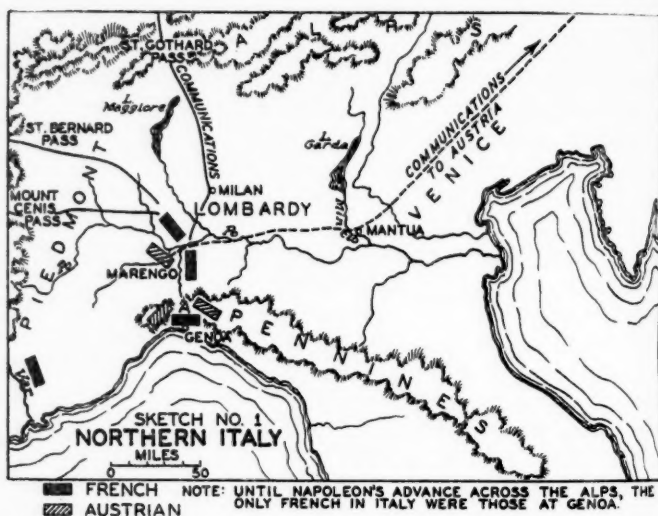
According to Fournier, whose three volumes on Napoleon take first rank among Napoleonic literature, there are four battles which stand out from all others as decisive events in Bonaparte's career. "Marengo established his power in France, Austerlitz secured him the preponderating influence in Europe, while Leipzig destroyed the latter and Waterloo the former." Let us then consider briefly the influence of supply features on

the strategy of the four campaigns which culminated in these decisive battles, and in addition Napoleon's disastrous retreat in Palestine in 1799, and from Moscow in 1812.

Taking these up chronologically it will be recalled that following the early Italian campaigns and the peace of Campo Formio in 1797, the Directory, governing France, considered seriously a plan to invade Egypt and another to invade England. Napoleon, realizing that with his star on the wane in Paris, he would have to gain fresh laurels, arranged for the Egyptian expedition and decided to lead it in person. In view of the withdrawal of the English Navy from the Mediterranean to protect its home shores from the rumored French invasion, Napoleon counted on mastery of the Mediterranean at least until his return from Egypt. His force of about 35,000 men was conveyed on 400 transports protected by fifteen ships of the line, fifteen frigates and many smaller war ships. The army landed at Alexandria and proceeded to Cairo while the fleet anchored in Aboukir Bay. Here Nelson, who had returned to the Mediterranean, surprised the French fleet and annihilated all but two or three vessels which took refuge in flight. Meanwhile Turkey, hearing that Napoleon was stranded in Egypt, declared war on France and Napoleon decided on an advance into Syria to meet the Turks as an opportunity for fresh victories to restore French political prestige lost by the disaster to the fleet. In spite of the fierce heat of the Sinai desert, El Arish and Gaza were captured with comparative ease and Jaffa was taken after a brief siege. The seaport of Acre was then invested. This was on 19 March, 1799. For a month the French used up their supplies and ammunition battering at the walls of this fortress to no avail. Finally, hearing of a second Turkish army sailing for the Nile Delta, having lost several thousand men for whom no replacements were available, plague having broken out and his supplies being about exhausted while an English fleet was landing both supplies and reinforcements for his adversaries, Napoleon, on 20 May started his withdrawal to Egypt. This was accomplished midst untold sufferings and despair on the part of the troops. And so we read in Napoleon's *First Maxim of War*, "Of all obstacles to the march of an army, the most difficult to overcome is the desert" and he afterward declared that "his imagination died outside Acre." He paid dearly for his failure to plan adequately for his supplies and was most happy to partially retrieve this failure by a brilliant tac-

tical exploit in which, with a force of 8,000 men, he accomplished a double envelopment of 18,000 Turks who had landed on the Aboukir peninsula and annihilated them.

Turning now to the Marengo campaign we find that the Second Coalition, consisting of Russia, Austria, England, Turkey, Portugal and Naples, had reduced the fortunes of France to a low ebb. Her field armies were greatly depleted and her treasury was empty. While the main theater of war was along the Rhine, another Austrian army had driven a small French army into the northwestern corner of Italy. By the middle of May 1800, the dispositions were as shown on Sketch No. 1.



Napoleon having overthrown the Directory and become First Consul, had ordered the formation of an Army of Reserve composed of all home troops that could be gotten together, plus a detachment of 25,000 from the Army of the Rhine, in all, about 60,000 men. Instead of choosing a direct advance from the Var River for the relief of Genoa, Napoleon decided to make a daring stroke at the Austrian communications which led to the Mincio. Leaving 13,000 French troops on the Var he moved 5,000 over the Mount Cenis pass, 35,000, whom he, himself, accompanied across the Alps by the Great St. Bernard while 16,000 more were moved through Switzerland over the St. Gothard. An examination of the *Source Book of the Marengo*

Campaign from the General Service Schools Press reveals with what care and precision Napoleon prepared for his own supplies, including base and advance depots along his lines of communication, though they were not so designated. He established ammunition factories to melt lead and mould projectiles, recruit depots, bakeries, etc., and personally urged the forwarding of supplies and men and animal replacements. When the Austrian Commander, Melas, heard of the French threat against his communications he began at once to concentrate his army. Meanwhile Napoleon had advanced successfully into the valley of the Po and had so disposed his forces as to close all avenues of retreat of the Austrians and had completely cut their lines of communication, while protecting his own through the St. Gothard Pass. Finally, on 14 June at Marengo, he decisively defeated the Austrians, and although the victory was largely due to a subordinate, General Desaix, "yet the results of that engagement and the entire credit of the daring campaign by which the enemy was reduced to such a precarious flight, are justly due him." The next day Melas sued for an armistice which was granted on condition that the Austrians retire and surrender all territory west of the Mincio which they did. For Napoleon it was a twofold success for it also firmly established his position in France.

In October, 1805, after his bloodless victory over the Austrians at Ulm was overshadowed by Nelson's immortal victory over the Franco-Spanish fleet at Trafalgar, we find Napoleon pursuing a retreating Russian army northeast from Vienna and unable to reach their rear before they were joined by large reinforcements. Protected by the fortress of Olmutz and with 80,000 men, the Russians were tempted into assuming the offensive by Napoleon who concentrated only 50,000 men in their immediate front, employing the remainder of his force in outlying detachments. The slowness with which the Russian decision to take the offensive was carried out permitted Napoleon to conceive and execute one of his most brilliant victories. By disposing his forces to invite a wide envelopment of his left flank, which greatly weakened the Russian center, he pierced their center, cut off their retreat and defeated each wing in detail at Austerlitz. "The Russians, with their artillery, munition and baggage lost, fled in wild confusion." Following this decisive campaign, Napoleon was able to dictate the terms of peace under which he dominated Europe for several years.

However, his dream of unlimited power led him into a war with Russia in 1812 and lured him on to Moscow. Back of his plan was the desire to close the entire continent of Europe against Britain, so that with her trade stopped she would be compelled to sue for peace and open the seas to world wide trade. Had he established a well organized supply system for his "Grand Army" of half a million men, or had the country passed through been able to support the troops, or had Napoleon been able to cut off the supplies of the Russian Army opposing him, success might have crowned his efforts. Instead, the Russians retreated before him destroying as they went, even to burning Moscow so that eventually he was forced to a disastrous retreat of several hundred miles in midwinter without supplies, amid untold sufferings and hardships which reduced his "Grand Army" to a mere remnant. Meanwhile British sea power continued to control the seas.

At Leipzig, in 1813, we find Napoleon crushed by converging forces of his enemies but as his line of communication was not cut he could extricate himself and withdraw safely to France. It is true, of course, that by so doing he surrendered a large sphere of influence in Europe.

Two years later, at Waterloo, we find him attempting a strategic penetration with insufficient means. His communications were not sufficiently safe-guarded. On the other hand Wellington had 18,000 men on his own right flank protecting his two lines of supply. Meanwhile, Blücher, defeated the day before by Napoleon, abandoned his best line of communication, withdrew toward the Anglo-Dutch to the support of Wellington and by a surprise attack against Napoleon's flank decisively defeated the French.

Wellington's sound ideas, however, found few disciples forty years later in the Crimean War where instead of striking at the enemy's communication we find the crowning blunder of a junior officer launching the famous "Light Brigade" straight at the Russian guns.

However, in the American Civil War, strategy and supply were closely linked with decisive results, as will be shown. There were four items in Lincoln's War Policy as follows:

- (a) Blockade of the South.
- (b) Control of the Mississippi.
- (c) Advance on Richmond and protect Washington.

(d) Advance into east Tennessee to cut the railroad from Memphis to Richmond. (See Sketch No. 2.)



Three of these are directly concerned with supply and the fourth indirectly. The blockade of the southern states was instituted promptly.

The repulse of Lee at Gettysburg is frequently spoken of as the turning point of the war, but on 4 July 1863, when Lee began his retreat from Gettysburg, Vicksburg surrendered to Grant, giving the North complete control of the Mississippi, a vital artery, as the Confederacy was then deprived of supplies and reinforcements from trans-Mississippi states. Many writers consider this event to have had a more decisive effect than the campaign in Pennsylvania. Following Grant's success at Vicksburg he was called by Lincoln to the supreme command leaving Sherman in command in the west. After cutting the rail communication between Memphis and Richmond, he advanced and captured Atlanta. This was not only the base of the army opposing him but was the junction of four important railways and the source of vital supplies. As Sherman pointed out it was "full of foundries, arsenals and machine shops . . . its capture would be the death knell of the Confederacy."

Following his capture of Atlanta, Sherman executed his famous "March to the Sea" destroying everything en route that might aid the south. Reaching Savannah he re-opened his communication by water, and turned north through the Carolinas toward Lee's rear. When Grant finally advanced in April 1865 after the four year strangulation of the south by the blockade, the severance of the western states and the loss of vital supplies from the south through Sherman's operations, Lee's surrender was a matter of days. General Edmonds, the British official historian of the World War, states that "The military genius of the great Confederate leaders, Lee and Jackson, the unrivalled fighting capacity of the Army of Northern Virginia, and the close proximity of the rival capitals, have caused a disproportionate attention to be concentrated on the eastern theater of war. It was in the west that the decisive blows were struck. The capture of Vicksburg and Port Hudson in July 1863, was the real turning point of the war and it was the operations of Sherman's grand army of the west which really led to the collapse of the Confederacy at Appomattox Court House."

In the Russo-Japanese War of 1904, we find that though Russia possessed sufficient military and naval resources to overcome her adversary, yet their distribution and the absence of well developed supply routes between Russia in Europe, and the theater of war, made command of the sea vital to Russia. On the other hand, loss of command of the sea for Japan would have exposed her to the danger of invasion and without naval supremacy her armies could not have reached the continent of Asia nor have been supplied or maintained there. Naval supremacy, then, was, for both sides, the decisive factor and when Japan bottled up and destroyed the major portion of the Russian far eastern fleet in Port Arthur harbor, then defeated the European fleet on its arrival, the fate of Russia was sealed. The slender life line of the single track Trans-Siberian Railway was insufficient to supply her armies and she eventually accepted defeat in a war which had not involved over one-tenth of her available forces.

Turning now to the World War, we find the French and British assuming the offensive at the Marne in 1914 when the impetus and the vigor of the German advance had been reduced by the waste of war, the necessity for making detachments to secure their lines of communication with Germany and the

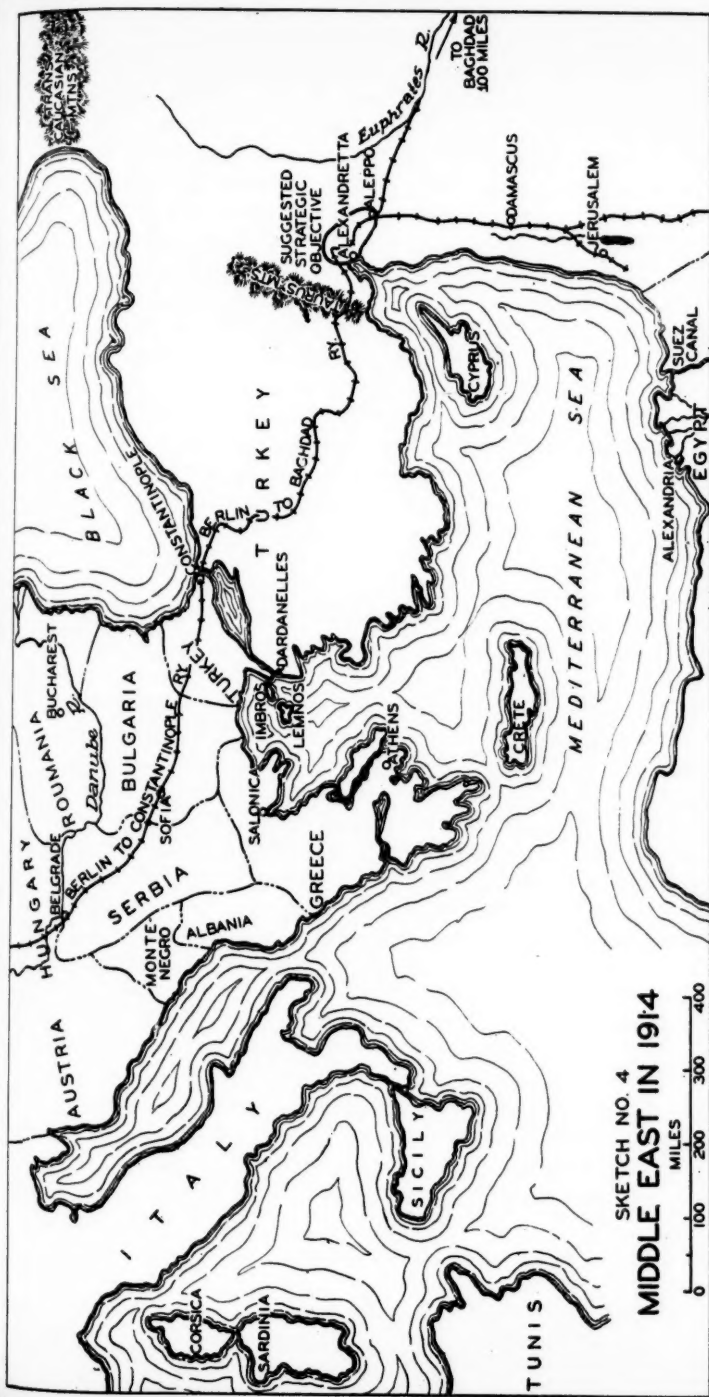
difficulties of maintaining supplies and ammunition. Thereafter followed four years of indecision on the Western Front while events were happening in many other theaters, some of which enabled the Central Powers to secure the necessary supplies to continue the war for a time while others eventually caused their downfall.

Reviewing briefly a few of those operations in which supply considerations played an important role, we note first that allied naval action swept the German mercantile marine off the seas and confined the German Navy to fortified harbors except for short raids, while allied troops and supplies were transported at will wherever required. The Central Powers soon found difficulty in obtaining adequate supplies of food and petroleum and of many raw materials required for the manufacture of clothing and munitions. This we shall see caused them to embark on numerous offensive campaigns to secure needed supplies, or defensive operations to protect them, meanwhile causing a large attrition in man-power and war materials that could not be replaced during the war. Even a casual study of various operations reveals that the Allies were also vitally interested in securing and defending certain supplies and lines of communication.

The strategic conception of the ill-fated allied attack on the Dardanelles in 1915, if carried out, would have meant, not only victory but peace. Success would have insured the safety of Egypt and that vital artery of allied supplies, the Suez Canal; it would have opened a route, summer and winter, for the supply of urgently needed munitions and equipment to Russia while the returning ships could have been laden with the harvests from Russian fields. It would have severed Turkey and the German communications with Middle East and rendered unnecessary the expensive Mesopotamian campaign inaugurated to save the Persian oil fields for the allied cause. It would have held Bulgaria neutral or brought her in on the allied side. It is difficult to see, under such conditions, how Germany and Austria could have continued the war beyond 1916. The verdict of Falkenhayn on the Dardanelles scheme was, "If the straits between the Mediterranean and the Black Sea were not permanently closed to Entente traffic, all hope of a successful course of the war would be very considerably diminished." Major General Sir C. E. Callwell, British Director of Military Operations, states, "The inception and the

conduct of the adventure have provoked bitter controversy. But no person of intelligence has ever suggested that the game would not have been worth the candle had the means for playing it effectually been available and had it been played with skill." (See Sketches Nos. 3 and 4.)





As to the means available, Egypt was an ideal base of operations, safe and easily accessible from England, India or Australia, while the islands of Lemnos and Imbros provided exceptionally good advanced bases for an expeditionary army. A sufficient force could have been collected in Egypt, organized, trained and supplied for the contemplated enterprise. Having absolute command of the sea would have permitted the Allies full liberty as to choice of objectives and a successful landing might well have ensued. The Turks had a thousand miles of coast line to defend besides the sixty miles of the Gallipoli Peninsula and could not have held strongly everywhere. Communications on the peninsula were poor and made dispositions and supply of troops there difficult. They were short of ammunition and had the attack fallen where they were least prepared they could hardly have resisted it. Instead, the British High Command, blinded by the proximity of the Western Front, failed to visualize the large possibilities of the Gallipoli operation, the big picture, shall we say, and foredoomed it to failure. Starting with a premature naval feint as a kindly warning to the Turks, the military forces gave the enemy further opportunity for preparation by poor planning and the necessity of returning the transports from Mudros to Alexandria for the reloading of supplies and ammunition for the landing. Throughout the entire operation, "the Government appears to have regarded the Expedition rather as an over-burdened father regards an illegitimate child put out to nurse in a distant village." Like many another piecemeal attack, had even a fair proportion of the approximately 400,000 men finally involved been committed initially in a coordinated landing operation, the enterprise could hardly have failed. Instead, Gallipoli will always stand as a horrible example of how *not* to conduct an overseas expedition—the major cause for the disaster being the lack of coordinated plans and failure, or neglect, of the British War Office to furnish adequate replacements, reinforcements, artillery, ammunition and other supplies.

The Palestine and Mesopotamian theaters were too remote, strategically, to exercise decisive effect on the main issues of the World War. However, the relation of supply to the local strategy in each case deserves study.

In Mesopotamia British aims and policy initially called for sending a small force (less than a division), to the vicinity of Basra at the head of the Persian Gulf to protect oil installa-

tions and check Turkish intrigues. As time went on the scope of the expedition was continuously enlarged until, with policy dictating strategy, a huge force was employed in an offensive toward Baghdad, for which the supply provisions were entirely inadequate. All communications were via the Tigris River hence river craft in large numbers and facilities for handling and discharge of cargo were vital necessities, particularly as each advance lengthened the lines of communication. General Townshend's failure to reach Baghdad was due to a lack of proper considerations for supply, maintenance and evacuation, but the fault may be traced more "to the Indian and British (Home) Governments, that ordered the advance even when the deficiencies in the system of supply were pointed out to them." The summer of 1916, during which General Maude succeeded to command in Mesopotamia, was devoted to preparation for the maintenance of the large army assembled on this front. Docks, wharves, roads, railways, road and river transport and hospitals had to be provided. "General Maude, by careful preparation, had constructed an excellent strategical scheme because it was commensurate with the ability to maintain the army. Earlier in the campaign, directly administration failed to keep pace with the ambitious strategical conceptions, there was disaster." Once supply was adequately provided for, the campaign proceeded to a successful conclusion.

Meanwhile, in Syria, with the Turks threatening the precious Suez Canal, Sir Archibald Murray was busy building on the shifting sands of Sinai a firmer foundation for success than his colleagues in Mesopotamia. Imagine for a moment, a theater of operations, "somewhere east of Suez," in which the chief sources of supply were thousands of miles away and no railroad led into the combat zone, the geography of which was such that ordinary means of transport were almost worthless. Add to this a great scarcity of water coupled with highly unfavorable climatic conditions and you have something of the situation that confronted the Egyptian Expeditionary Force in the Spring of 1916. The story of how these almost insuperable obstacles were overcome constitutes an unique page in military history and one of which the British are justly proud.

Like Napoleon's campaign of more than a century earlier, the war in Sinai and Palestine was to a decisive degree a struggle between the two systems of communications of the opposing forces. Napoleon lost but the British were wiser.

Development of a huge supply base, construction of many miles of railroad, piping fresh water from the Nile into Palestine, organization of the Egyptian Labor Corps and the Camel Transport Corps were progressive steps in the big plan of supply and maintenance carried out. Without the supply system originated by General Murray the Palestine operations could not have even started; *with* that system, as later developed by Allenby, he was able to achieve one of the most brilliant military successes yet recorded. General Allenby's much quoted dispatch of 28 June, 1919 speaks for itself: "I desire to express my indebtedness to my predecessor who, by his bridging of the desert between Egypt and Palestine, laid the foundations for the advances of the Egyptian Expeditionary Force. The organization he created, both in Sinai and Egypt, stood all tests and formed the cornerstone of my successes."

In studying the Palestine campaign we find it divided chronologically into three distinct periods or phases, each characterized by a concentration of forces and supplies, followed by a vigorous advance into enemy territory. The final and decisive thrust as we know cut the Turkish communications in rear of their Seventh and Eighth Armies and resulted in an astounding victory for Allenby in this last and greatest of the Crusades.

B. H. Liddell Hart states that, "the plan abundantly fulfilled Willisen's definition of strategy as 'the study of communications' and Napoleon's maxim that 'the whole secret of the art of war lies in making one's self master of the communications.'" In view of the colossal expenditures of men, munitions, equipment, and supplies of every description from 1915-1918 in Mesopotamia and Palestine, it is pertinent to consider for a moment the strategy of a plan to deal decisively with the Turks in the Middle East by one coordinated effort struck at Aleppo via Alexandretta, in order to sever their communications with Mesopotamia and Palestine. (See Sketches Nos. 4 and 5.) Aleppo was the junction of routes from Mosul and Baghdad on the Tigris, with the long and frail line of communications on which the Turkish Armies in Palestine depended. In January 1915, Lord Kitchener advocated such a plan and the post-war comments of Hindenburg and Enver have shown how this would have paralyzed Turkey. A successful operation here, from an advanced base at Cyprus, would certainly have released many valuable divisions for employment in more vital theaters.



Looking now at a few of the operations of the Central Powers, we see that in October 1915, Mackensen, with a combined German and Austro-Hungarian Army, drove the Serbian Army away from its supplies and munitions to the shores of the Adriatic. Having secured possession of Serbia's resources he then opened up a direct line of communication through friendly territory to Constantinople. By sending munitions to Turkey her fighting power was materially increased. Again, in the Brusilov offensive in June 1916, we find the supply and communications situation having an important bearing on the result of the operations. Russian Army Commanders were directed to plan for an offensive with *only the resources then in their armies*. Austria was pushing an attack in Italy and had greatly weakened her forces on the Russian Southwest Front. Brusilov's attack then came as a complete surprise and quickly

broke through the Austrian lines. However, neither troops nor supplies for exploitation were available and the superior German and Austrian railways quickly rushed troops from all fronts to the threatened sector and plugged the gap. The result: indecision.

After two years of neutrality Rumania joined the allied cause in August 1916 and immediately became the object of German design. Falkenhayn and Mackensen combined in a skillfully executed maneuver against her weak flank and rear drove the Rumanian Army north of Bucharest and secured possession of most of Rumania's wheat and oil and other important strategic materials.

The further search for sustenance led Germany, following the defeat of Russia in Poland, to invade the Ukraine and Caucasus. As General Ludendorff later remarked, "I wanted no territory in the Ukraine and Caucasus. My only object was to secure the supplies that were so urgently needed for our existence and the prosecution of the war." The German decision in 1917 to employ unrestricted submarine warfare is evidence of the extreme measure of retaliation to which they were driven by the Allied blockade of their supplies, a condition then approaching economic collapse. While this move threatened for a time to reduce England to starvation the curve of tonnage losses gradually dropped off; and with the entry of the United States into the conflict the weight of man-power and resources turned definitely against Germany. However, with the collapse of Russia in 1917, releasing pressure on the Eastern Front, Ludendorff concentrated his efforts on the famed Spring offensive of 1918, in the West, hoping for a decision before the American flood could pour into France. No permanent advantage was gained. In fact, with the achievement by the Allies of Unity of Command under Foch the offensive passed from German hands, though they were still far from the Rhine.

It will be recalled that following the defeat of Serbia in 1915 a deadlock had ensued for three years while the Bulgarians guarded the lines of communication from Austria to Turkey. In the fall of 1918 Foch sent General d'Esperey, one of his most brilliant officers, to command an Allied force at Salonika composed of French, British, Greeks and Serbs, with a view to an early offensive against Bulgaria. In September with the Serbs striking the main blow, the Bulgarian defenses were penetrated, the flanks rolled back, and in five days Bulgaria asked

for an armistice. Their own (the Allies) communications being then safe, the Berlin-Constantinople railway was next cut while the victors pushed on to the Danube. Isolated from the Central Powers, Turkey surrendered a fortnight later and Allied fleets entered the Black Sea. Austria, pressed by Italy and with her back door unguarded, sued for peace on 3 November, while on the 11th, Germany, war-weary and suffering from lack of food, signed the Armistice. While the capitulation of Austria was the "last straw," the collapse of Bulgaria, and the communications she was protecting, was the decisive stroke that insured the early defeat of the Central Powers.

SUMMARY

We have seen, then, how the Greeks turned back an army of approximately 400,000 men by sinking the ships containing their supplies.

Hannibal destroyed a Roman army by threatening its supplies.

The Mongol conquerors succeeded brilliantly by getting a part of their forces astride their enemies' communications.

American independence was achieved at Yorktown through the isolation of Cornwallis from his supplies and reinforcements.

Similarly Napoleon, isolated in Egypt by Nelson's destruction of the French fleet, was unable to properly prepare for his invasion of Palestine and withdrew ignominiously from before Acre while British ships were landing both supplies and reinforcements for his enemies.

Melas, the Austrian commander at Marengo, finding his communications cut by Napoleon agreed to abandon the whole of Piedmont and the Milanese and to retire behind the Mincio.

At Austerlitz, by penetrating the Russian center and cutting their communications, Napoleon won a memorable victory. Seven years later, lured on to Moscow by a retreating Russian Army through a barren country, he was forced into a disastrous retreat. At Leipzig, a year later, he suffered a tactical defeat but withdrew safely to France. While at Waterloo he lost his last battle, due to a surprise flank attack that turned defeat into rout.

In our own Civil War the progressive steps of economic pressure of Lincoln's War Policy, such as the blockade, control of the Mississippi and control of the East Tennessee-Georgia

area, finally deprived the South of anything with which to wage war.

In 1904, Japan gained control of the sea and won the war because the slender thread of the Trans-Siberian Railway could not maintain the Russian Armies.

In the World War we had a virtual stalemate on the Western Front for four years, considered broadly. Meanwhile, in other theaters, supply and strategy went hand in hand to success or, by divergent paths, to indecision or failure.

We saw how the Dardanelles operations, offering strategic consequences of stupendous magnitude to the Allies and dire disaster to the Central Powers, was a tragedy from start to finish. Begun with insufficient means and never having the enthusiastic support of the War Office in either men or supplies, it became one of those lost opportunities that never returns.

In Mesopotamia we found that state policy, dictating a three hundred mile advance to Baghdad before the supply and maintenance could be adequately provided for, resulted in a costly failure. After General Maude organized a supply system commensurate with his force, the campaign succeeded handsomely.

The foundation for Allenby's magnificent victory lay in the work of the Royal Engineers and the Royal Army Service Corps. "A triumph of organization and perseverance unsurpassed in the annals of the empire" said he.

To complete the destruction of the Turkish Armies, Allenby's strategy called for cutting their communications in their rear.

We have traced a series of operations by the Central Powers designed to strengthen their weakening economic structure and secure the supplies to enable them to prosecute the war. Included in these were the conquests of Serbia and Rumania, the opening of the Berlin-Constantinople Railway, and the invasion of the Ukraine and the Caucasus.

We found that unrestricted submarine warfare was the next step in Germany's struggle for existence. The defection of Russia then provided her with a breathing spell but not salvation. "The Yanks were coming" and with almost unlimited resources.

D'Esperey then struck the fatal blow, Bulgaria fell, communications with Turkey were cut and Ludendorff sent word

to the Imperial Chancellor in Berlin that defeat was impending and to request an armistice.

CONCLUSIONS

What conclusions, then, may we draw from the foregoing that tend to confirm or clearly illustrate our accepted principles, doctrines and methods as to strategy and logistics?

(1) That an adequately protected supply system commensurate with the force to be employed is a prerequisite for success.

(2) That to be decisive, operations should be directed against the enemy's source of supplies whether it be a nation, a field army or a detached division.

(3) That in view of the importance of mobility in modern warfare, other considerations being equal, the combatant with superior communications should win. This includes control of sea and air as well as rail, road and river communications.

BIBLIOGRAPHY

- Babcock, Lt.Col. G.E.: *History of Transportation Service of the Egyptian Expeditionary Force.*
- Bird, Major General Sir W.D.: *Director of War.*
- Bird, Brevet-Major W.D.: *Strategy of the Russo-Japanese War.*
- Callwell, Major General Sir C.E.: *The Dardanelles.*
- Cary, Henry: *Herodotus.*
- Fournier, August: *Napoleon.* Volumes I & II
- General Service Schools: *Source Book of the Marengo Campaign.*
- Gordon-Smith, Captain Gordon: *Grand Strategy of the World War.*
- James, Lt.Col. Walter H.: *Modern Strategy.*
- Kearsey, Lt.Col. A.: *Egypt and Palestine Campaign.*
- Liddell Hart, Capt. B.H.: *Decisive Wars in History.*
- Liddell Hart, Capt. B.H.: *Great Captains Unveiled.*
- Maurice, Major General Sir F.: *British Strategy.*
- Miner, Major Harold E.: *Critical Analysis of the British Government's Part in the Initiation and Conduct of the Gallipoli Campaign.* (Group Research Study, 1933)
- Napoleon: *Maxims of War.*
- Neame, Lt.Col. Philip: *German Strategy in the World War.*
- Nevinson, Henry W.: *The Dardanelles Campaign.*
- Pollin, Major G.A.: *How did Supply affect Townshend's Advance on Baghdad.* (Individual Research Study)
- Smith, Major Ralph C.: *Strategy of the Civil War.* (Lecture)
- Study of the Strategy and Tactics of the Mesopotamia Campaign, 1914-1918.*
With special reference to General Maude's operations.

Section 2

ABSTRACTS OF FOREIGN-LANGUAGE ARTICLES

This section contains abstracts of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Section 4.

CONTENTS

	Page
Study of War Plans and the Realities of War.....	27
Study of Military History.....	41
Principal Lessons from the Abyssinian War.....	46
Organization and Employment of Motorized Units.....	49
German Army Maneuvers, 1936.....	52
Essentials about Antitank Defense.....	59
Preconceived Ideas Affecting Leadership.....	62
Withdrawal of the German 113th Division Behind the Marne on 19-20 July 1918.....	65
Protection of the Rear of the German Eighth Army During the Battle of Tannenberg.....	78
Supply of the Far Eastern Soviet Army.....	86
The Reasons of Italian Success.....	92

A STUDY OF WAR PLANS AND THE REALITIES OF WAR

["Studie über Operationspläne und Kriegswirklichkeit," by General Wetzell. *Militär-Wochenblatt*, 4, 11 October 1936.]

Abstracted by Major E.F. Koenig, Infantry

I—PRINCIPLES

Since the close of the World War there have appeared in Germany as well as elsewhere the official histories of the war, and a number of other publications by experts and novices who have attempted to criticize the war plans and operations. This is quite understandable, and we may expect no change of heart in the future. After all, the purpose of the study of military history is to learn from the experience of the past, and scientifically prepared considerations by qualified experts are of great value. The war plans of the belligerents have been the target of an exceptional amount of criticism because they governed the situation throughout 1914, that is, during the period of open warfare.

The unfortunate ending of the German operations in 1914 have called for a great deal of one-sided criticism, which, however, in most cases makes no allowances for the realities of war. The Germans just do not understand why "the best army that the world has ever seen" should be denied the victory which had been so confidently expected. The general opinion is that the failure was due to the abandonment of the so-called "Schlieffen Plan" of 1904-1905, and the substitution therefor of Moltke's concentration plan of 1914. As a result the theorists have gone astray, the "plan" became more important than its execution, and these theorists are all far removed from the realities of war, and lessons that could be learned from the actual operations.

In war, the plan is not the decisive factor, but its execution. In the hands of a genius even a mediocre plan may lead to brilliant success but the best plan can be spoiled by faulty execution. Furthermore it is a dangerous practice to attempt to draw lessons from the happenings in 1914, for we know, according to General Haeseler, that the doctrines of peace are usually the causes of defeat in campaign. There is nothing more dangerous than the theory that the outcome of a campaign depends upon the excellence or deficiencies of the war plan. It depends much more upon the quality of leadership and the condition of the army. Field Marshal von der Goltz used to say that one should never speak of war "plans," but of "projects," because the very first information of the enemy might vitiate any "plan." The greatest of all strategists, the elder Moltke, said: "No war plan extends beyond the first meeting engagement with hostile main forces. Only the layman believes that the course of the campaign has followed a predetermined course, which has been planned in detail far in advance, and has been clung to tenaciously to the bitter end." Moltke always quoted Napoleon, who said: "I have no war plan," and has always maintained the same with reference to the Franco-Prussian War of 1870-1871.

Finally, the greatest of all leaders of the World War, the still living Ludendorff, who proved his greatness by actual accomplishments, and who had become the inspiration of the German Army during the War, said in his last military book, *Modern War*, in very plain words: "The concentration plans of General Schlieffen against France was ideally suited for the conditions of 1904-1905, but not for 1914, at which time

the French offensive in Lorraine had been clearly determined." He concludes: "If, under the concentration plan of Schlieffen, the left flank had been defeated at Saarbrücken by the French superiority, which actually was committed to the attack in 1914, a later success on the right flank could not have been exploited."

His further discussion of war plans is amplified as follows: "With all seriousness, it is to be emphasized that concentration plans are merely what the name implies. In their conception they of course take into consideration the later operations, and the formation adopted must fit into these, but under no consideration are these plans to direct the movements of the forces after the moment when the first information of the enemy has been received. Paper wars stop there, and the seriousness of the realities of war becomes paramount. The latter does not call for the execution of theoretical plans, but the exploitation of hostile weaknesses." In actual war the commander-in-chief is placed in situations which can not be predicted, and they demand that he be free of all "indoctrinations" and of preconceived plans, but he is called upon first of all, to annihilate the hostile army.

Such a result can not be achieved in a single decisive battle in these days of armies numbering millions, extending all the way from Aix la Chapelle to Basle, and confronted by a capable enemy of equal combat efficiency. Such a battle of decision is prevented by geographic considerations of rivers, swamps, forests and lakes, as well as by the artificial limitations of the fixed fortifications. Even the most brilliant plan for a strategic envelopment or penetration will hardly assure success, because, as the elder Moltke said: "War plans depend upon their success not only on one's own operations, but upon the action of the enemy as well." The first general success will therefore be accomplished by a number of minor successes achieved by armies or groups of armies in the compartments of the terrain created by geography or fortifications. The difficult task of the higher leadership is to coordinate these local successes, and even defeats, so as to bring about a definite victory for the entire force. Moltke says: "The tactical results of battles are phase lines for new strategic decisions. The success or failure of each battle changes the general situation to such a degree that no one is in a position to see beyond the first encounter." These thoughts, based on actual experience, are

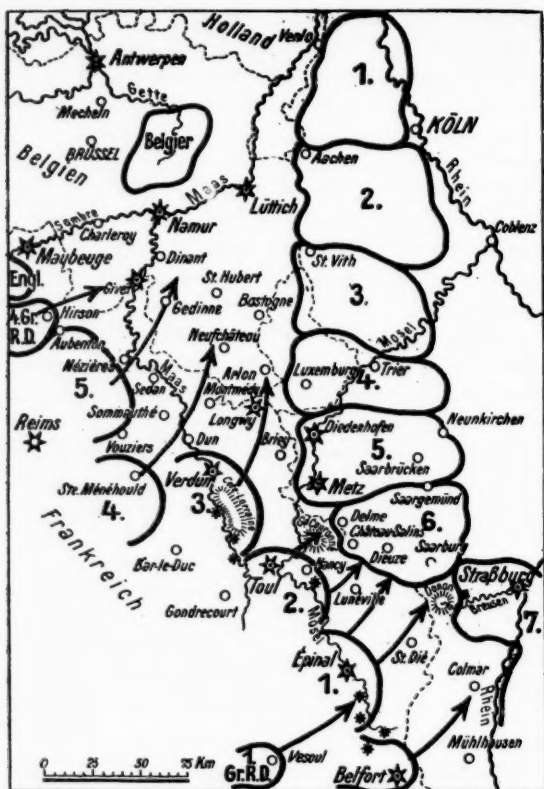
really nothing new or startling, and their truth is nowhere so apparent as when applied to the World War. If we carefully analyze history we find that the much discussed "Schlieffen Plan" proved a handicap all the way from the period of concentration to the execution of the battle of the Marne. The mirage of a "plan" was opposed to the realities of actual war.

In reality the theater of operations of the World War consisted of three distinct parts: Belgium west of the Meuse, the sector between the Meuse and the Moselle, and the area south thereof, which was separated from the others by the French line of fortifications. If the French were to remain behind their line of fortifications: Verdun—Toul—Epinal, as Schlieffen had properly concluded that they would in 1904-1905, then there were only two theaters involved, and the southern theater of operations became more and more of secondary importance as compared to the northern one in Belgium. If, on the other hand, the French were to take the offensive, as General v. Moltke properly deduced, then the entire situation was changed. The three theaters of operation acquired entirely different values, separately, and in relation to one another, provided that one wanted to defeat and annihilate the enemy, wherever met, in open warfare. This fundamental conception was not adequately considered in the draft of the concentration plan for 1914. This plan does not admit that an annihilating victory in any one of the three theaters would have been decisive for the outcome of the entire campaign. For that reason the Schlieffen principle, which was still the basis of the 1914 plan, involving as it did the ideas of envelopment, concentration of the mass on one flank, all with the ulterior motive of driving the French against the Swiss boundary, acted as an obstacle rather than as a help in the execution of the actual operations. All that was necessary was to coordinate the concentration plans in each of the three theaters by placing the maneuvering force on the right flank. Then it would have been quite conceivable that in the southern theater the enemy would have been driven against the Vosges, in the central theater against the Moselle and Metz, and in Belgium against the Meuse, and that he would have been decisively defeated in each of the three theaters of operation. This would have been far more simple and easier of execution than the much more ambitious plan of driving the entire French army against Switzerland.

We know that General von Moltke had considered such a plan, especially as it concerned the situation in Lorraine, but had permitted himself to be dissuaded therefrom in the light of the original Schlieffen plan. It is true that if such a plan would have been adopted it would have called for a much more active and capable leadership by German general headquarters during the battles on the frontiers. For example, general headquarters would have had to take direct charge of the three armies in the center, the Third, Fourth and Fifth, while v. Bülow would be given charge west of the Meuse, and the Bavarian Crown Prince in Lorraine. Such a course of events would have been fully justified, but the utilization of the Third and Fifth Armies, especially, acting as general reserves, should have been in the hands of general headquarters, and not left to the army commanders, as was done in 1914. It would have been conceivable that the entire Third Army, and its contingent portions of the Fourth Army, would have been committed east of the Meuse, in the central theater. On the other hand, the actual situation showed that it would have been desirable to use two or three corps of the Fifth Army via Metz—Thionville as the decisive element in the Lorraine theater. By such versatile use of the armies, general headquarters could have intervened in the battles of the frontiers, and by proper employment at the decisive points brought about local victories at all three theaters of operation. These would have been conducive to a general victory.

The illusion of a large scale envelopment and annihilation prevented the execution of the local victories which otherwise would have been possible. This shows the danger of far-reaching war plans, which are not justified in the face of the stark realities of war. These call for a sober consideration of actual facts and not for illusory hopes; in war we must have a definite, purposeful aim to defeat the hostile army under full utilization and exploitation of all the enemy's weaknesses, and to annihilate him. This could not have been accomplished in a single decisive battle, but first of all in a number of local successes, whose results were later coordinated for the achievement of a general victory.

It has always been that way in history. The battle of Leipzig was preceded by the battles along the Katzbach, at Dennewitz, Grossgörschen, Wartenburg and Kulm. The battles of Weissenburg and Wörth led to the operations around



Sketch No. 1

Metz in 1870, and the battles of Vionville and Gravelotte to the battles of Sedan.

The undecisive character of the battles of the frontier in 1914 were due to the neglect of the above mentioned principles; they were the first decisions of the war, and they led to the even more indecisive Battle of the Marne, at which the relative strength of the forces at the decisive point had been completely changed to the disadvantage of the Germans.

Lieutenant General Kabisch recently published a criticism of the Moltke concentration plan of 1914, in which he not only found fault with the concentrations as they actually took place, but also offered the desirable constructive suggestion of how he would have improved the concentration in accord with

the situation at that time. It would be rather interesting to compare his suggestion with the Moltke-Ludendorff plan for 1914.

General Kabisch drew upon quotations of the elder Moltke. He assumed that the strategic objective of the war was Paris, in front of which the French armies would array themselves for a decisive battle. The French army thereby became the immediate objective. It was necessary to be the strongest for this decisive battle. This is no new idea. The younger Moltke indicated as much in his orders of 27 August. General Kabisch only sees the mistake that Moltke used only two-thirds of his army for the decisive battle, leaving one-third as protection in Lorraine. In other words, he returns to the original Schlieffen plan, which, according to General Ludendorff, was ideal for 1904-1905, but unsuited for 1914.

However, his quotation of the elder Moltke is not considered justified in the present situation. The latter said: "In the campaign of 1870-71, the seizure of Alsace-Lorraine, which we shall desire to keep and use in the peace negotiations, is one objective, while Paris, the center of France, is the other. The immediate objective in either case is the French army. The war plan consists of a coordinated advance in the direction of Paris, until we meet the French army, and meet it in a decisive battle. We aim at Paris, because that is the direction in which we are most likely to meet the main French forces."

One thing is clear, however. The French army was the principal objective and Alsace-Lorraine and Paris were only theoretical and ultimate objectives. Ludendorff argues exactly the same way.

Now what was the situation in 1914? As General Moltke (the younger) clearly indicates, the French had as an ultimate and secondary objective, Alsace-Lorraine. Based on this, and the knowledge that the French were planning an offensive (alliance with Russia), the plan for 1914 was developed. In view of the fact that Germany did not have to seek the French army, because the latter was doing the Germans the favor of seeking them, Germany should have expected the decisive battle on their own soil or in Belgium. Paris receded as a distant objective.

In order to prove the faulty estimate of the French strength in Lorraine, General Kabisch quotes Joffre, and points to the geographical situation which would have made an attack with

the main army in Lorraine physically impossible. The question now hinges entirely on the definition of the term "main army." In 1912 Joffre had pointed out to the French Chamber of Deputies the difficulties of an attack in the corridor between Metz and Strassburg. But what persuaded him then to commit one-half of the entire French army to an attack in the direction of Saarbrücken? For a while the French toyed with the idea of committing their Third Army in Lorraine as well, and the German general headquarters and even the Sixth Army feared at the time a French penetration between the Fortress Kaiser Wilhelm II and Pfalzburg. The terrain (the Vosges) would have made it difficult, but it was possible. Moltke's ideas were therefore not entirely fantastic. In his war plans he usually figured on an attack by three French armies. Joffre's statements have no bearings on this situation. The actual facts of war are determining. Almost one-half of the entire French army (9 out of 21 corps, 6 reserve divisions, and 4 cavalry divisions) were committed in this theater of operations. From the German point of view this was the most stupid thing that the French could have done, with the line of fortifications to their rear. But on the other hand, their political objective was Alsace-Lorraine, and German general headquarters had to figure on that. Therefore Ludendorff says that a crushing of the German left flank, which would have been entirely conceivable had the Schlieffen distribution of forces been adhered to, would have vitiated any success the right flank could have achieved. The elder Moltke argued the same way in 1870, when he said that during the scattering of the German forces along the Moselle, if the French would have been able to achieve numerical superiority at any one point, and brought about a local German defeat, then the remainder of the German army would have been halted as well.

Furthermore, General Kabisch criticizes the strength on the right flank. He calls for a holding together of the available forces, so that the largest possible force would be available at the decisive point. What is the decisive point, or what does he consider to be the decisive point? He does not consider the First Army, but the entire right wing as the decisive point. This argument is hardly convincing. In the battles of the Sambre and of the Meuse, the First Army was double in strength as compared with those of its opponents. General Kabisch differs from the elder Moltke who says, "A prerequisite

to success lies in the presence of adequate forces at the decisive point." And again, "It depends upon capable leadership to have, even though inferior in numbers as a whole, superiority at the decisive point." In the battles of the Sambre and the Meuse, this was true at the decisive point in front of the First Army which had a strength of five corps. Even if the bravely attacking Second Army would have been driven back on the Sambre, a proper leadership of the First Army would have been able to turn his reversal into victory on the German right; but on 23 August 1914 this was not taken advantage of. This was not the fault of the concentration plan of 1914, but was due to other causes, which we shall not discuss here. Ludendorff's opinion is therefore correct: The plan of 1914 did contain the possibility of a German victory.

The essential difference between these varying concepts is that in 1914 the three separate battles of the frontiers represented a single decisive engagement. The Moltke plan of 1914 was based on such a conception, and according to Ludendorff, correct. Schlieffen's plan was correct for 1904, but was based on an enemy who remained west of the Meuse, and called for the decision to be sought during the advance on Paris, beyond the Belgian-French frontier. The entire operations depended upon the action of the enemy.

The author does not agree with General Kabisch's opinion that the weight of the German concentration in Lorraine was bound to bring about an independent battle there. As a matter of fact the instructions for the concentration, as well as the later orders of general headquarters clearly indicated a desire for the opposite. Much more difficult was the actual situation in which one could throw the enemy back, but, on account of his fortresses in rear, never defeat him decisively. Although general headquarters refused to issue any orders to that effect, it still wanted a decisive defeat in Lorraine, and as a result the frontal attack there had no more success than the all-enveloping maneuver on the right flank.

II—AN IMPROVED CONCENTRATION PLAN IN 1914?

General Kabisch's suggestion for an improved concentration plan is as follows: The Sixth Army (less the XXI Corps) of four corps, to be located behind the Fourth and Fifth Armies as a general reserve. The general headquarters would be in a position to "use it as a reinforcement of the flank protection,

if such action would be called for, or, on the other hand, have it follow the right flank, as soon as the danger to the left flank, so feared by Moltke, had proven unwarranted."

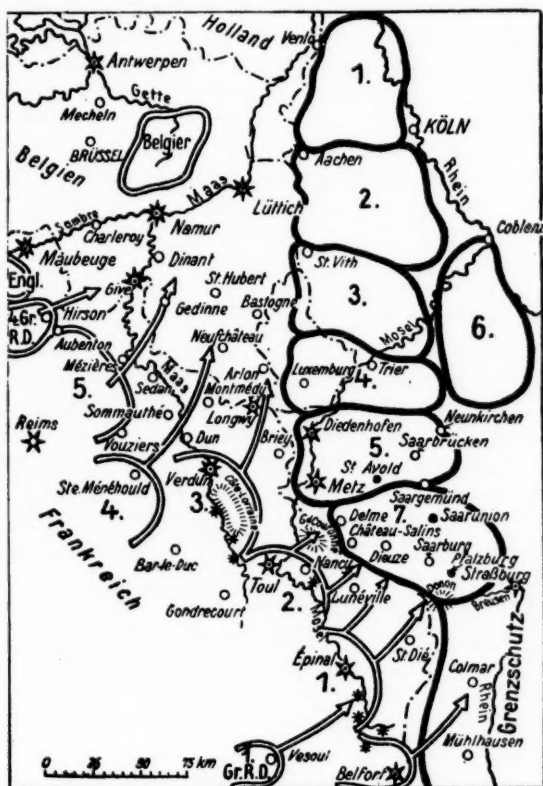
General Ludendorff states in his book: "Due to a particularly unfavorable geographical situation, a nation may be forced to keep some of its reserves in the zone of the interior, along railroads, to use them as soon as the situation has become clarified. But the principle that all available forces should be committed, must not be violated by such action." I believe that the last named principle is the important one with reference to the situation in 1914.

Exactly what was the situation with reference to concentration plans? General von Schlieffen in his plan had used all available railroads and every single unit for an advance on a broad front from Aix la Chapelle to the Vosges, without leaving a single unit back as a general headquarters reserve. He had kept the left flank weak ($3\frac{1}{2}$ corps), which corresponded to the enemy situation at that time.

Since Schlieffen's retirement the German Army had been increased by approximately five corps. This reinforcement was used by Moltke, taking into consideration the altered French situation, to reinforce the now threatened left flank, by creating there two armies of a total strength of eight corps and three cavalry divisions. Based on the principles enunciated by Ludendorff, Moltke certainly was justified in this change. Another thing we must bear in mind is that all concentration plans are drawn up in times of peace, and after the war we frequently see the situation differently than it appeared then. No Chief of the General Staff can predict the quality of the hostile army. It seems very simple to dispense with flank protection strategically, and to say that one would suffice there with skeletonized forces. With hindsight one can then well prove that one could have contained large hostile forces there with a minimum of troops, while the main decision was fought on the opposite flank. Joffre experienced the identical thing on the Sambre when he would not believe the reports of his Fifth Army commander as to the strength of the advancing Germans through Belgium, and as a result became involved in a very dangerous situation. Was not this a similar situation to the German one on 2 September, when they broke off contact with Manoury's Sixth Army and, in order to envelop the French

main army, continued past Paris, and toward the east? Result: The battle of the Marne and the second turning point of the war.

General Kabisch then draws upon one of von Schlieffen's lectures, and uses the following quotation with reference to the Jena campaign in 1806: "Napoleon has been criticized for advancing too close to the Bohemian frontier and it has been said that he ran the danger of being driven against the neutral Austrian soil. Such a criticism is inapplicable, because Napoleon executed the maneuver not for the purpose of being defeated, but because he wanted to win." Schlieffen then continues to say that the situation depends frequently upon the self-confidence of the commander. The author believes that more can be added to the subject. For example, Napoleon made a cor-



Sketch No. 2

rect estimate of his opponent's capacity. On the other hand, Napoleon's faulty estimate of the hostile commander cost him his empire at Waterloo. He underestimated the combat power of Blücher, who after Ligny was still able to strike the decisive blow at Waterloo. Military operations depend upon the enemy. It would have been inexcusable if the German General Staff in drawing up its concentration plans had not evaluated the French army as of equal combat efficiency with their own. Let us not forget that the French forces defeated in Lorraine by the German Sixth and Seventh Armies, placed the latter in a very difficult situation for a few days. This is the best argument for Ludendorff's plan. It bases things on the actual realities of war. In war, success is not dependent alone upon the ability of a commander and the excellence of a plan, but to a large extent upon the combat efficiency of the troops. Self-deception in matters of that kind may lead to very bitter disappointments, as Austria discovered in Serbia and Russia in spite of the great ability of their commander, Field Marshal Conrad von Hötzendorf.

We must assume that the plan suggested by General Kabisch was considered by the German war plans section before the war. Then why was it not adopted?

The reasons are quite obvious. The concentration plan in 1914 called for the full utilization of all the railroads crossing the Rhine. Two-thirds of the German army was to concentrate between Aix la Chapelle and Thionville between the seventh and fourteenth mobilization days. If a reserve army was to be added, it would have delayed the concentration (which was slower than the French anyway) by an additional two days. What that would have meant, we need not enlarge upon. Such a reserve army could only have been brought up as a second echelon somewhere in the area: Coblenz—Kreuznach—Bingen. From there it could have been moved by the four-track railroads to Lorraine, but its movement behind the right flank would have been more difficult and could have been executed only by marching. This would have kept this reserve army several days marches in rear of the maneuvering forces, and it would have arrived too late to have had any influence upon the Battle of the Marne. Even the danger on the left flank would not have been obviated thereby.

Let us take for example the situation on 14 August 1914. Let us assume that on that day the detraining of the reserve

army was beginning in the Coblenz area, and that, in accord with the Schlieffen plan only four corps and two cavalry divisions were south of Metz.

On 13 August the Intelligence Section of the General Staff issued the following estimate: "The French First, Second, and Third Armies of a total strength of twelve corps are concentrating between Epinal and Toul. It is estimated that echeloned to their left rear they are being followed by two reserve corps, each composed of four reserve divisions."

This was the situation confronting general headquarters in Berlin, on which date they were preparing to move into the field. They found in Lorraine a threefold force of the enemy (ignoring the French VII Corps which was making a thrust at Mühlhausen).

A decision had to be made. It was quite evident that in the face of the (incorrect) estimate of the enemy situation, that the weak (according to Schlieffen—Kabisch) left flank forces were threatened by an attack on the part of greatly superior forces.

What should have been done with the reserve army? Should it be kept where it was to await further developments, and thereby lose valuable time? Should it be committed and ordered to follow the maneuvering right flank? Certainly such decisions could not be made by responsible authorities. If the forces in Lorraine were left to their fate, pending the decision in the north which was to take at least an additional ten days, then this army would be left in a most critical situation, which no commander-in-chief could countenance. He would have placed the fate of the entire campaign in the hands of a subordinate, at a time when the situation looked very serious, unless one were to discount the combat efficiency of the French army as negligible. There was no indication then justifying such an assumption. On the other hand, there was every reason to believe that there would be a rapid and determined advance of the French between 16 and 18 August. The fact that the French lacked dash and vigor in their attack in 1914, was probably due to the fact that they had correctly estimated the size of the forces opposing them.

Therefore, it is believed that on 14 August any sensible Chief of Staff would have ordered the detrainment of the Reserve army to the lines: Treves—Thionville (Trier—Diedenhofen), and Saarbrücken—St. Avold.

It appears probable that exactly such situations had been war-gamed in times of peace, and that it was therefore decided that the wisest thing to do was to have the increment of the German army, since Schlieffen's time, added to the defensive forces in Lorraine.

Even if a reserve army would have been committed in time to assist the forces in Lorraine, such an operation would have been subject to possible difficulties and friction, and it would have been much simpler to have had the reserve army in position and ready to operate from the very beginning, the way it was done in 1914.

In view of all the above considerations, the author concludes that, in full agreement with General Ludendorff's opinion, the distribution of forces on the left flank of the German army in 1914 was the correct one. The detailed concentrations could have been improved by holding the Sixth Army further in rear, and alongside of the Seventh Army (which never should have been engaged in the Vosges), in order to give these forces greater maneuver space, and to increase their possible effectiveness in case of pursuit.

If a reserve army would have been located behind the center in 1914, the German left flank would have lost the initiative there and placed it in the hands of the enemy. Neither could it be predicted in times of peace that the surprise attack on Liege would have been so successful, and that the vital railroad running through Liege would have fallen into German hands so early in the game. General Kabisch describes these as "luck."

Considering everything and basing one's judgment upon the realities of war, one is bound to come to the conclusion that the concentration plan in 1914 was correct in view of the situation. On the other hand one will also have to agree that General Moltke was not able to rid himself entirely of the original Schlieffen idea. He did not take advantage of the enemy's weaknesses.

The blame for the failure in 1914 therefore does not rest with the war plan, but with its execution. That was the tragedy of Moltke's inadequate leadership. The realities of war do not call for the execution of plans, but for the exploitation of hostile weaknesses.

This principle, enunciated by General Ludendorff, is the great lesson of the World War for future generals.

THE STUDY OF MILITARY HISTORY

["Military History and Modern Warfare." By "Juniper." *Journal of the Royal United Service Institution*, February 1936.]

Abstracted by Major F. During, Infantry

All great commanders have stressed the value of studying military history. Napoleon once said: "Read and re-read the campaigns of the great captains," and "History is the only true philosophy." Every officer is told to read military history, but few, however, seem to understand how it should be read and studied and so waste a great deal of time and effort with little practical result.

Some officers seem to think that little of value can be obtained from the study of past wars because conditions have changed so enormously. It is hoped to show that there is a middle course between those who only live in the past and those who will have nothing to do with it. The chief objects of a study should be to discover lessons for the future and to gain an insight into the human element in war. The human element often seems to be the only stable factor in a changing world. Military history may also be studied with the special objects of learning something about the topographical features and climate of a potential theater of war, or the characteristics of a possible enemy, and finally, a study of history trains the minds of future commanders.

No two campaigns are similar. A student of war, therefore, should endeavor to read as many as possible, and the more dissimilar they are the better. He will thus learn about war in all its varying aspects.

Military history should be studied, and not merely read. Many histories make interesting reading—for instance, Henderson's *Stonewall Jackson*; but, if they are read as novels, the student will gain little of value. Nor is it of benefit committing to memory a large number of facts, figures and dates. It is the deductions we draw from history that are of value, especially with regard to future wars. For this reason little of value can be learned from a study of the tactics since tactics change constantly, and a future war will probably be very different from the last one.

The chief points that the student should look for in military history are:

(1) The problems as they presented themselves to the commanders in each situation and how they dealt with them; and the reasons for success or failure.

(2) The human factors—psychological and physical. How situations acted and reacted on the minds of commanders and troops, and the physical capabilities of men and horses, remembering that "What man has done, man can do."

(3) The lessons and principles brought out by the campaign, for future guidance.

The student should take each situation as it arose, place himself in the position of the commander, and "estimate the situation" from his point of view with *only the information available to the commander at the time*. This is most important, for a commander seldom knew all the facts and often a great deal of his information was wrong. To know all makes the problem easy. Having made his solution, the student should compare his plan with the commander's, and note where he thinks his own is better than the commander's, or vice versa.

The student should then organize and arm the forces of both sides according to present systems and reconsider the situation; and finally, he should organize and arm them as they will probably be, say, ten years hence, and estimate the situation anew. He should make any adjustments of dispositions or locations which would obviously be demanded by modern weapons. He should remodel the whole campaign assuming that both sides had modern arms. He might come to the conclusion that the campaign would have been fought out in a totally different way. In this way "The outline of things to come" may be forecasted with tolerable accuracy. "It is not genius," said Napoleon, "which reveals to me in a flash what I must do, but previous thought and study."

The human element in war is always interesting. The will power of a commander is constantly subjected to a host of outside pressures; on the ability with which he can resist them will depend to a large extent the success of his plans. All great commanders expected great, and at times incredible feats of endurance from their men. Napoleon and Jackson often marched their troops 30 miles a day, and on one notable occasion Jackson marched a brigade 50 miles in 24 hours. Tamerlane's army, each man mounted on one horse and leading three or four others, marched normally 100 miles a day, crossing mountains, deserts and large rivers. The cowboy of South

America thinks nothing of riding 100 miles in 24 hours. Such, then, are the feats of which men and horses are capable. Does it not entitle one to think that men and horses trained to such heights might be able to keep up with a mechanized force?

The principles of war are said to be constant, but no two commanders agree as to what exactly they are.

Stonewall Jackson summed up the art of war as "to mystify, mislead, and surprise the enemy." This phrase "contains all the law and the prophets." To mystify the enemy commander is to surround him with the fog of war so that he does not know when, where, or from what direction the next blow will fall. This may be accomplished by spreading false information and by the skilful use of detachments. To mislead him is to convince him that the blow will fall at some place other than that selected, and may be achieved by feints and other means. To surprise him implies that he is unprepared for the blow when it does fall, and in order to bring this about, it will be necessary to move sufficient troops secretly and swiftly to the decisive area. Unless one side is overwhelmingly superior, this order of events is almost invariably followed. Classic examples are Napoleon's campaign of 1796 and Allenby's of 1917.

In peace-time we pay little, and in war scarcely more, attention to the principles of mystifying, misleading, and surprising. It is all the more necessary, then, to have courses at schools where all methods for accomplishing these ends are studied, and where commanders and staffs are trained in their use. Some of the methods now used or suggested are amateurish. In map problems and maneuvers the composition, strength and location of practically all the enemy troops are known, so commanders have much fuller information than they would ever have in war, and therefore gain little practice in one of the most difficult problems they may have to face. To obviate this disadvantage the director of a map problem might hold a force in reserve under his own hand to throw in as he decided on one side or the other. In the recent maneuvers in Italy, a reserve force was used by the Director to influence the battle, but on this latter occasion both sides knew the strength of the reserve force and that it would be used either for them or against them, so some of the effect of surprise was lost. It is suggested that some such device, either of a reserve or an unexpected weapon of war, should be employed in exercises

and maneuvers to mislead and create surprise. The greater the surprise, the greater the value.

The first principle of mass is defined as the concentration of the maximum force at the decisive time and place. But if history is studied, it will be found that victory is frequently gained with considerably less than the maximum force. To concentrate it at the outset militates against mystifying, misleading, and surprising, and so defeats its own object. A too liberal interpretation of this principle has sometimes led to disaster. Gideon in his night attack on the Midianites (Judges, chapter 7), concentrated only 300 men out of 32,000. He was successful because he relied on *surprise* and *quality*, rather than *quantity*. Tamerlane advanced on a front of two hundred miles, but his mobility enabled him to concentrate on the center in one day, or on either of the wings in two. In the World War, large numbers of men were put into a small area without attempting to distract the enemy, and suffered in consequence. The Germans, by blows in Turkey, Serbia, Rumania, Russia, and Italy, were more successful. They made the Allies disperse their forces. To take an extreme case, if a commander can cause such distraction of his opponent that the latter has only one man left at the decisive point while he himself has two there, he will have fulfilled the principle of mass.

Alexander's campaigns are worthy of study. He crossed the deserts into Mesopotamia during the burning heat of summer and surprised the Persians who thought such a feat impossible. He again surprised them by crossing the snow-covered mountains into Persia in the depths of winter with only a handful of his "Companions," and caught them in winter quarters. If he had concentrated his "maximum force" he could not have moved till the season was more favorable, and so would have lost his opportunity. We can also learn from his tactics. On the field of battle, though generally outnumbered, he was invariably successful. He placed the bulk of his cavalry—the main hitting arm in those days—on one flank, to distract the enemy commander, and his infantry in the center to pin him down. With his "Companions"—a picked body of horsemen sworn to victory or death, he sought a way round the enemy's other flank, and from there charged home straight at the enemy commander. If we substitute "mobile force" for "Companions" we can discover a good lesson for the use of a modern mechanized formation.

These are but a few examples from ancient and modern history which show that there is a wide field of research.

War has changed more in the last thirty years than in the previous three centuries, till now it more probably resembles some of the campaigns of the ancients than those of more recent times. Mechanized armies have brought back the mobility of Genghis Khan, Tamerlane, and Alexander. An examination of their campaigns might be profitable.

It has been said that Generals are "damn good at supervising platoons, but damn bad at commanding divisions." This is undoubtedly a libel. It is true that higher commanders do not get sufficient practice in handling troops in the field, which is essential for training commanders. This, owing to lack of money, is not easy to remedy. The next best substitute is to be found in war games in which the wits of one man are pitted against those of another, at little or no cost. War games and command post exercises based on situations of actual campaigns can be of value in studying military history. Some exercises and maneuvers should be set with the special object of encouraging originality and surprise, so that commanders may experience some of the fog that is always present in war.

Military history shows:

(1) That "to mystify, mislead, and surprise the enemy" are the first essentials in war.

(2) That quality is preferable to quantity.

(3) That a small force that can surprise is better than a large one that cannot.

(4) That a commander must retain his liberty of action while restricting that of the enemy's.

(5) That administrative sufficiency and efficiency are vital. Modern armies, with their mechanization, are more dependent on good communications. They cannot "live on the country." Hence they are very susceptible to failure of supplies. The tendency now is to over-insure administratively so that the anomaly has arisen that an endeavor to increase speed has actually reduced it.

PRINCIPAL LESSONS FROM THE ABYSSINIAN WAR

["Premier enseignements de la guerre d'Abyssinie," by General Rouquerol. *Revue Militaire Suisse*, June 1936.]

Abstracted by Major T.R. Phillips, Coast Artillery Corps

Tactics depends upon the technical possibilities of matériel; but these possibilities vary each day with the progress of invention. Technical facts which have been decisive in wars of the past may no longer have application. If we are not to be hypnotized by the facts of the past we have to follow all the practical tests in which war matériel is employed. The Italian-Ethiopian conflict acquires an obvious interest in this respect. The observations drawn from an essentially colonial campaign cannot be transposed without reflection to a European theater of war; but they can be considered from the point of view of mechanical performance of matériel and will give positive results as to the service we can demand of it.

The Italian success in Ethiopia is the result of foresight and careful staff preparation. The seaport at Massaua had to be rebuilt to handle the traffic anticipated. A base had to be built at Asmara, 6,000 feet above sea level. Men debarking at Massaua were moved at once to Asmara; supplies were kept there only long enough to be classified before being forwarded. The climate at Massaua is intolerable for Europeans while that at Asmara is quite supportable.

Before the war, connection with Massaua and Asmara was maintained by a narrow gauge railway of doubtful dependence. The first feat of the Italians was the construction, in a few weeks, of an automobile route between Massaua and Asmara. It is 75 miles long, cutting and climbing the most difficult mountains. Thirty thousand laborers working day and night accomplished this gigantic task.

The number of automobiles running over this highway quickly reached 1,200 each way. But since the road was too narrow for two-way circulation, the convoys going up used the road for twelve hours and the convoys coming down for the twelve hours following. In spite of heavy day and night traffic, numerous sharp turns and steep slopes, the number of accidents was extremely few.

The next step was the building of a second route to establish a one-way round trip between Massaua and Asmara. This was opened to traffic in November. Finally, an aerial

cable was installed to carry trucks over the most difficult ravine, reducing the length of the journey by an appreciable amount.

Routes were equally important in all operations. To borrow a sentence from General Badoglio: "We had to give two thousand blows with a pick for each blow (shot) with a gun." The labor for road building was furnished initially by enlisted laborers. These were managed by cadres of engineers. When the continuous offensive was finally taken up it was necessary to turn all troops into road builders as necessary. Between 9 and 17 April, when a road was cut between Quorum and Dessie, Marshall Badoglio wrote: "For 50 miles all the men of all the corps, without exception, including the doctors and medical attendants, worked on the opening of a trail with an ardor that no words can express." It was often necessary to construct long difficult roads to bring artillery into position. In one of the last battles, 2,500 artillerymen went to build a road of access to their positions of the next day while their guns remained parked in a ravine.

There is no region in Europe with as few roads as Ethiopia; but this is no reason to believe that the enormous movements of motors foreseen in the future will be practicable with existing communications. As in Ethiopia it will be necessary at times to build them.

Roads were used by large convoys as soon as they could be without great risk; but the work of improvement was continued without ceasing. Thousands of automobiles constantly on the road furnished the transport in the theater of operations. Types of automotive vehicles are sufficiently numerous to insure their perfect adaptation to any service that is needed. In Ogaden, for example, there were trains composed of a tractor and two trailers on caterpillar treads. This was able to transport 70 tons of material across swampy country where the wheels of horse-drawn vehicles would mire themselves to the hubs. This load represented the daily supply of a division.*

After the month of March the Italian southern front was more than 625 miles from Mogadiscio, the base port of the southern offensive. The Ethiopian command counted on the

(*This statement is apparently erroneous. Caterpillar tractors hauled two half track caterpillar trailers each carrying ten tons, a total of twenty tons instead of seventy. These were organized into convoys of about 600 tons and were sent out under protection, making the round trip from the base to the troops at Neghelli in thirty days.—*Translator's note.*)

impossibility of transport in this region as soon as the rains became frequent. This would have been true even with pack animals. But they were stupefied to see that bad weather hindered neither supply nor operations.

The extremely frequent use of motorized columns was of great military value. Certain operations effected by completely motorized detachments should be remembered. For example, the march of General Starace's corps at the end of March with 500 automobiles on Gondar, where he arrived on 1 April. His movement, completely unexpected everywhere, caused such surprise that no reaction was possible.

After the occupation of Dessie and the construction in a few days by 20,000 laborers of a road 50 miles long fit for motors, 1,600 automobiles were assembled there. They left at dawn on 26 April in a single column; the advance guard was composed of a group of armored cars. The vehicles moved with 10 yards distance between them. One hundred fifty airplanes furnished an uninterrupted service of information and reconnaissance during the entire march. The troops requested from the aviation the materials and supplies they needed. An example is cited of a repair section which received a machine lathe by air.

The effectives carried by this column reached 25,000 men. It arrived before Addis Ababa on 5 May. It had not encountered any resistance on the part of the inhabitants. A few Ethiopian soldiers who were roaming the country after the defeat of Lake Ascianghi, made a show, the first day, of resistance. A short advance guard action of armored cars quickly dissipated it.

The absence of aerial adversaries simplified the task of the Italian aviation. After the first movements on 3 October on three routes in northern Abyssinia separated by impenetrable mountain masses, liaison between the columns was established by plane and radio. The direction of operations was thus based on the assurance of liaison that they were able to establish with even the most advanced detachments, except, and worthy of note, in case of extremely bad weather.

Airplanes were used extensively for supply service. At the outset of the operations the Italians only thought of it in especial cases of detachments difficult to reach by other means and for very restricted tonnages. This was the case with the

light columns in the march on Makale in November and in January for the division hastening to the battle of Tembien.

But the method was rapidly standardized. The troops on the march asked for the supplies they needed by radio. They received them on the spot named by air. At the end of the campaign this was no longer a partial or exceptional operation. Transport by aviation had become a normal means of supply for troops on the march.

On 19 April, the aviation, without interrupting its reconnaissance and exploration, supplied an entire army corps, dropping packages by parachute. In the Quoram zone all of the Eritrean army corps were supplied by air. The motorized column which crossed the desert from the port of Assab to Sardo, by an audacious march of extreme difficulty, was also supplied exclusively by air.

The amplitude of these operations shows the possibility of supplying important bodies exclusively by aerial transport. This solution will, in case of necessity, be of great importance for motorized bodies, exposed by their dependence on supply, of being deprived of the independence and ubiquity that they should have due to the rapidity of their movement. The ability of an organization of this nature to order its supplies by radio, a few hours (at the most) before delivery, is a vital advantage.

ORGANIZATION AND EMPLOYMENT OF MOTORIZED UNITS (A French View)

["Gliederung und Verwendung motorisierter Verbände." *Sanct Christophorus*, August 1936.]

Abstracted by Lieutenant Colonel S.J. Heidner

This is a review of an article by General Culmann in *France Militaire*. The author distinguishes between three types of divisions which are organized differently and have different mobility and tactics. They are:

- Partly motorized divisions
- Fully motorized divisions
- Armored mechanized divisions.

Partly motorized divisions.—According to French regulations these are divisions in which only the reconnaissance and signal units and the trains have been motorized. The daily

march for such a division is about 15 miles. The infantry marches and fights on foot and the artillery is horse drawn. The employment of these divisions is exactly like that of any other division without motor transport. The author suggests the improvement of these divisions by the addition of light track-laying tractors for all heavy infantry weapons, all accompanying weapons, and for the antitank and antiaircraft weapons. This addition would not increase the daily march rate of the division nor change its method of fighting, but it would facilitate the handling of the division on the battlefield and increase its fire action.

Fully motorized divisions.—In these divisions the infantry is transported in trucks and the artillery is drawn by tractors or is mounted on self-propelled tracked vehicles. Part of the command, reconnaissance, and communication units are mounted on tracked vehicles. The heavy infantry weapons are drawn by tractors. By this arrangement the daily march rate increases from 15 to 70 or even 140 miles and the rate of march from $2\frac{1}{2}$ to 10 or 12 miles per hour. However, the infantryman still fights on foot and must dismount from his truck to go into battle. Considering the time that it takes to entruck and detruck, and the time of the march itself, such a movement is profitable only when it is for a distance greater than 40 miles. From this it follows that fully motorized divisions lend themselves to employment only in operations on a large scale.

The motorized division in an undeveloped form was used during the World War to shift reserves behind the lines. The horse-drawn artillery in such cases was not moved by truck and usually arrived two or three days later. This splitting up of the division is avoided when it is fully mechanized.

On the battlefield the infantry of motorized divisions will be limited to the same mobility as formerly. The artillery, however, should be able to follow the infantry more closely and to support it continually.

A fully motorized division with about 3,000 motor vehicles for its combat troops has a march length of at least 65 miles and is difficult to maneuver. For this reason it must march in several columns. This will also increase the entrucking and detrucking points and diminish the danger from air attack. Solid fronts, behind which motor movements can be made in safety, as in the World War, will probably not be found in the future. Hence the division must have special units for recon-

naissance and security. Cloudy weather, darkness, and fog are favorable for the maneuver of large motorized units.

Mechanized divisions.—The author quotes General Buat as follows: "In the face of the heavy fire of the battlefield of the future, no combatant will be seen with unarmored breast." And again: "The appearance of the motor on the battlefield gives mobility its former significance. The front-line company in the future will be a tank company, by which it is not to be inferred, however, that there will no longer be an infantry. The automatic weapon which was designed to kill humans will give way to an automatic weapon designed to destroy tanks."

To bring back mobility to the battlefield, the mechanized division must be able to put down the hostile fire which can check its movement. This means that it must be able to destroy machine guns and field pieces. For this purpose it needs machine guns, small-calibered automatic cannon firing armor-piercing projectiles, flat trajectory guns, and high angle cannon. On account of the speed of the modern tank, all these weapons should have a rapid rate of fire.

Tanks must have protection against hostile antitank weapons. Protection is offered against rifles and machine guns and even against heavy armor-piercing machine guns of 25-mm. by 30-mm. armor. For protection against field pieces an armor of from 50-mm. to 60-mm. is necessary. This indicates the necessity for heavy and light tanks. There will also have to be special types, such as command tanks, signal tanks, and smoke-laying tanks.

The selection of the right moment for the mechanized division to enter the battle is very important because it goes into action rapidly and when it has once been committed it can not be recalled. For this reason the mechanized division must be led by airplanes, or better still, by autogyros. Control is maintained by radio. If observation and control is not to be disturbed by hostile aviation, air superiority must be maintained.

The mechanized division works together with the air force; its attacks will be supported by low-flying attack aviation. Since the amount of ammunition which tanks and airplanes can carry is limited, their fire will be of limited duration. The mechanized division has the further weakness that it can not hold a position on which it has arrived, because as soon as it immobilizes itself it invites destruction. For this

reason infantry on cross-country vehicles and tractor-drawn artillery must follow it. As long as the infantry is on trucks it is very vulnerable. If it dismounts too early it may arrive on the battlefield too late. The cooperation of the mechanized division with the infantry is therefore very difficult.

The author concludes that the mechanized division is not suited for a prolonged hard fight, but that it is better fitted to fight an enemy who has only limited defensive means or whose morale has been shaken. It is particularly useful in the following cases: for the attack of a thinly held front, as, for example, an attack against frontier guards; to attack a retiring enemy; or to counterattack an enemy from the front or flank who has just penetrated a position. The mechanized division is especially adapted to exploit a success. It should not be used to replace cavalry divisions. The cavalry division is particularly useful before the battle, while the mechanized division finds its greatest use at the conclusion of the battle.

THE GERMAN ARMY MANEUVERS, 1936

[From an article by Lieut.-Colonel H. de Watteville. *Journal of the Royal United Service Institution*, November 1936.]

Abstracted by Major F. During, Infantry

The 1936 German Army maneuvers took place in Hesse, and lasted from 21 to 25 September. These maneuvers are of great importance, because they were the first of its kind since 1913, and conducted by the new German Army, which used modern military equipment. Nearly 50,000 men participated. The troops engaged on the two sides were: *Blue*, IX Army Corps, composed of 6th, 9th and 19th Divisions; *Red*, V Army Corps, composed of 10th and 15th Divisions. The former, commanded by General Dollman, came from the Cassel area; the latter, commanded by General Geyer, was brought from Stuttgart. The maneuver area was roughly marked by the towns of Eisenach—Marburg—Frankfurt—Schweinfurth; this represents a square of 80 miles, but nothing like this whole area was used.

The maneuver was supposed to be an outflanking movement in an imaginary "race to the sea," but as both sides were flanked by assumed forces, whose movements were announced, the maneuver really took place in a vast corridor, with either force virtually unable to do very much more than advance or

retire. The whole scheme had the advantage of extreme simplicity; while it possessed the great merit that the IX (Blue) Corps, at the start of the exercise, had its three divisions disposed in depth; the 9th Division was leading, the 19th Division stood twenty miles in rear, while the 6th, being brought into the area by rail, was actually detraining still farther back on the opening day. These dispositions allowed of an interesting series of situations; it gave the commander of the Red force initial superiority, of which he availed himself to the full in order to attack. The arrival of the second Blue division (19th) stabilized the battle front until the third, 6th Division, by a march of thirty to forty miles, arrived in time to permit Blue to make an attack on Red, who was falling back on to an entrenched position. There is, however, no need to study this side of the maneuvers any further, for their main interest lay in the troops, their bearing, their armament and their tactical methods.

The German army of today represents the new army raised by compulsory universal service. The *Reichswehr*, the professional long-service army of two years ago, has vanished, having been absorbed into the new army in the shape of officers and noncommissioned officers. The rank and file seen on these maneuvers were, therefore, men with only one year's training behind them. They will now do a second year's service before passing to the reserve, while this year's annual contingent of recruits is about to enter the ranks. The men are young, but physically well developed. There is a shortage of officers; no company or battery had more than two during the maneuvers. But of their efficiency there can be little doubt. The noncommissioned officers are excellent and professionally competent. The discipline of the men seemed to be above reproach. The German Army of 1936 promises to be in no way inferior to that of 1914. By abolishing the *Reichswehr*, as was done at the time of the formation of the new army, Germany was unquestionably running risks. There is, however, no doubt that the change was most carefully prepared, for the aspect of the troops is one which conveys the impression of both the old and new elements having fallen into their places exceedingly well. In billets and on the march, everything pointed to complete control of the men by their officers and noncommissioned officers. There were manifest all the symptoms of a thoroughly good spirit among the troops, as well as familiarity with life in

the field. The *Reichswehr* has certainly done its work well, in that it has successfully passed on to those young soldiers all the knowledge and methods of the old pre-war army. Incidentally it should be mentioned that the traditions, titles and trophies of the old army, which were preserved in the *Reichswehr*, have now been passed on to the new creation. There can be little doubt that the new regiments will be inspired by the quality and history of their predecessors.

In the field, the tactical methods pursued by the new army are entirely practical and modern. Infantry advances showed flexibility and use of ground. Artillery, always firing from concealed positions, was difficult to locate. The reason for this might perhaps be largely attributed to the fact that the field gun seems to have disappeared from the armament of the division. The corps and army artillery has been considerably strengthened and is being rearmed.

All the troops were heavily camouflaged with branches or bits of foliage stripped from the trees. As the area in which the exercises were held was thickly dotted with woods, it could be seen that cover from the air was studiously sought. The marked scarcity of hedges greatly facilitated movement in and out of woods, as well as the passage from one cover to another. When no wood was available, vehicles always seemed to stand as close as possible alongside a tree, bush or hedge, if these were at hand. Artillery was frequently covered with nets or horizontal canvas screens. It may be said that German troops are well trained in the use of cover against air observation, although nothing very new could be detected in their methods.

Two remarkable features of the new German division need mention. The first of these is the number and ubiquitous distribution of the new antitank artillery. The gun itself first requires a word of explanation. It is mounted on a shielded carriage; the latter (in the later types at least) possess a split trail, thus giving the gun a wide arc of traverse, and is mounted on rubber-tired wheels. The whole is drawn by a four-wheeled tractor. Judging from the size of the tractor, and the number of vehicles not employed in hauling guns, the ammunition supply of these guns must be on a generous scale. The actual distribution of the guns in the division seemed to consist of one battalion of three companies (36 guns) at division headquarters, together with a section allotted to the division reconnaissance unit. Fractions of the headquarters battalion were to be seen

everywhere. It is clearly a most elastic unit, designed to be split up and allotted to any part of a marching column, or of an established front line. On approaching the latter from the enemy's side, it was normal to find, first an infantry sentry hiding behind some natural feature or bush; next, 150 yards farther back, a heavily camouflaged antitank gun well off the road. The mobility of these little guns is remarkable; even on the worst by-roads in the maneuver area or across country they could travel 20 miles per hour.

The other outstanding feature of the new division is the division reconnaissance unit, a mechanized creation of most modern type. At the head of the unit is a company of armored cars, four-wheeled at present, though it seems probable that they may be either reinforced or replaced—at any rate partially—by heavier six-wheelers. Two companies of infantry, at present conveyed in trucks, but which may eventually be mounted on motorcycles and side-cars, support the armored cars. As light mobile artillery for this unit, there are an anti-tank gun detachment and a light infantry mortar section. Lastly, there is a machine-gun company. The whole at first sight, appeared to be somewhat of a menagerie of weapons; in practice, however, the unit proved to be perfectly well knit. It would seem that the whole unit would be pushed forward to reconnoiter; then, as soon as contact was imminent, the infantry and machine-gun company would form a screen, while the antitank guns and mortars might be employed as circumstances should dictate. The armored cars, for their part, moved by "bounds" from one tactical feature to another. Such at any rate seemed to be the procedure on the initial day of the maneuvers, when the opposing detachments established touch with each other. But any accurate picture of the work and tactics of these units was really difficult to obtain.

The division, as a whole, is mechanized, but it is surprising to find a considerable number of horses interspersed among the machines. The division cavalry squadron having been abolished, a troop has been allotted to each infantry regimental headquarters for reconnaissance and intercommunication. These troops resemble the section of French cavalry reservists allotted to an infantry regiment on mobilization and should prove of real value. Horses next appear in the machine-gun units. These comprise two types of carriages: the first, a four-horsed limbered vehicle on which were set two heavy machine guns on sleigh

mountings; the second, a two-horsed vehicle carrying a single machine gun that might have been fired off the carriage. The former is intended to be employed as a "galloping" carriage to reinforce a threatened point, but its superiority over the two-horsed vehicle is not obvious. In the division on the march horses reappear at several points. How far it is proposed to eliminate animal draught is not clear. But when, as was the case, it is possible to see horses and motors employed to draw similar types of vehicles, the presumption is that the machine will in due course oust the horse.

There are two facts to be emphasized in considering this question; the first is that the present rearmament of the German forces, embracing as it does no less than 36 divisions, is immensely costly. It does not follow then that what may be seen at present is the definite form that the division may assume in a few years' time. And this assumption gains strength when it is recalled that, as one travelled towards the rear of the division and past its supply columns, the amount of horse-drawn transport increased. There was even a quantity of locally hired transport to be seen that cannot represent a final organization. And mixed with these civilian vehicles there was a mass of gaily painted oil trucks, labelled "Shell" or "Esso," that tried to hide their bright red and yellow livery under a somewhat inadequate camouflage of fir branches. From the air these must have resembled travelling Christmas trees. All this can only be regarded as an extemporization. On the other hand, German military opinion is persistent in considering a possible Eastern theater of war. On the muddy plains of Poland and Western Russia the motor, it is urged, may be of doubtful utility. Consequently, with a view to a possible campaign in these parts, the horse must be retained. Such, at any rate, is the plea put forward by competent German officers when the subject of mechanization is pressed.

The whole question of mechanization is, in fact, very much in the air. When German authorities asserted that they are, as yet, in the dark as to the future form of their mechanized units and formations, their statements may be accepted without reserve.

A regiment of light two-man tanks was employed on these maneuvers. On their first appearance, one company carried out a spectacular attack against a strongly held hill. Maneuvering skilfully to utilize cover, their attack was considered as

successful, although the casualties were adjudged to be so heavy that they were put out of action for the rest of the day. In view, however, of the strength of the antitank armament of the German division, such a result was not surprising. But in this movement, although, as a matter of fact, they were being employed in prolongation of an infantry attack, the tanks left their infantry far behind. They did not attempt to carry out any serious outflanking movement. The German army obviously possesses an efficient, well designed, two-man tank: it moves smoothly across country and with little noise. Only one breakdown was seen. On the final day of the maneuvers the entire strength of these tanks, 140 in number, was turned over from the Red to the Blue side. They then carried out a somewhat spectacular—though impressive—attack on the Red entrenched position, this being the finale of the exercises. Owing to distance and light it was difficult to follow the movements of the tanks: sufficient to state that the machines appeared to work fast and with cohesion. It should, however, be noted that there was no attempt to match tank against tank, nor were any other machines in the field than the two-man tank. But abundant reports were current to the effect that heavier machines would soon be in use. There seemed to be much reticence on the subject, and quite comprehensibly so. The prospect seems to be that two types of heavier tanks will be provided, and that these will form the backbone of the three existing—or possibly five—armored divisions. What the role to be assigned to these divisions might be in war would be difficult to say. They are as yet obviously in an experimental state, although a portion of a division was exhibited at the Nazi rally recently held at Nuremberg.

The entire mechanical equipment of the divisions is of excellent quality. The motor vehicles allotted to headquarters of infantry units (down to platoon commanders) are strongly built four-wheeled cross-country cars; these have steel-plated sides and have sufficient power to tow another vehicle. Signal and engineer units have a number of these machines, all modified or enlarged to suit the needs of each unit. The motorcycles to be seen were of different patterns; the first and older type was one adapted from civil life; the second, and more recent, has been designed for military purposes. It is a most efficient and robust machine with a broad, rigid chassis, while the silence of a section of these machines moving at a good speed is such as

to render their passage all but inaudible to an observer standing a few hundred yards away.

The antiaircraft equipment of the division is at first sight rather scanty. But the German principle has been to place the entire antiaircraft armament under the orders of the air force. So much so that all antiaircraft troops wear air force uniform. The result is that antiaircraft defence is regarded from the point of view of areas to be protected. Movements of antiaircraft units are thus carried out accordingly and seem to be largely independent of that of the divisions, although they were clearly not conducted without reference to the movements of the latter. These antiaircraft units are certainly most interesting. Their equipment consists chiefly of four-gun batteries, some armed with an 88-mm. gun, fixed to a mounting, capable of rapid travel. The entire battery is mechanized, and as none of this equipment bears an earlier date than 1934 it may be assumed that it is altogether of a most modern type. The battery is fought by some form of electric predictor, either from the guns or from a short distance away. Other units are armed with a small antiaircraft gun, which should also form an efficient antitank weapon. It is a miniature of the heavier gun and seems to possess all its advantages. Searchlights accompany the batteries: these are of a most powerful type; the current necessary to work them is generated by large engines mounted on separate vehicles. Infantry units carry tripods, intended for the use of light machine guns against low-flying aircraft. These could frequently be seen set up in positions of readiness.

Three army air squadrons were allotted to either side during the maneuvers. These did not combine with the tanks during the attack of the latter machines. There was not as much low-flying activity in conjunction with troops as might have been expected, only one such attack being witnessed by the writer. On the other hand, a number of bombing attacks took place, one of which at least resulted in a noteworthy air battle. But information as to the German air units, or of their work on maneuvers, did not appear to be too freely circulated.

ESSENTIALS ABOUT ANTITANK DEFENSE

["Notwendige Feststellungen zur Panzerabwehr," by Captain v. Moltke. *Sanct Christophorus*, August 1936.]

Abstracted by Lieutenant Colonel S.J. Heidner

The author of this article, Captain von Moltke, notes that during the last months an increasing number of articles on antitank defense have appeared in the military journals. This observation is not only limited to the German press. These articles show the stimulative and fruitful effect of the interchange of ideas but there is also a danger in this. So long as the discussions are limited to the realm of tactics there is no danger that any secrets will be exposed, for tactical perceptions can not be given out for the training of troops until they have been reduced to practical regulations and then can hardly be kept secret. As long as they remain theories only, there is, after all, nothing to expose.

The benefits derived from the technical military press can not be denied. There is the typical example of the Englishmen, Fuller and Liddell Hart, who were unable to put through their theories while they were in service. They became trail blazers only after they exchanged the sword for the pen. Even the troop officers should get useful information and professional stimulation from the study of the military journals. Sometimes, however, discussions can be carried so far that instead of clearing up a question they befool the same.

This situation seems to have been attained in the field of antitank defense. An endless stream of opinions and counter-opinions, propositions and counter-propositions for this and that method of combat or for this or that kind of equipment has recently appeared. What should the tank unit do on the march; what in the attack; how does it conduct itself in delaying action; how in the defense; what action does it take when blocking roads; what does it do in the retirement? These are some of the questions asked. Then too the matter is complicated by the fact that distinctions must be made between the immediate antitank defense of troops and antitank defense from the standpoint of the higher commander; between defense against scout cars and against tanks; and between the antitank defense for foot or horse troops, and that for mechanized troops themselves. The troop officer who encounters this confusing mass of opinions will give up in despair.

Here the author ventures the opinion that for practical training, at least as far as the platoon and subordinate leaders are concerned, these problems have no application; they solely affect the battalion commander and higher leaders. So long as we use a horse or tractor-drawn gun there are only a few methods of employment possible for all situations. They do not differ in the attack, the defense, the delaying action, or in road blocking.

For all situations there are four possibilities of employment to which practical troop training can be limited. They are:

- Concealed emplacements
- Prepared emplacements
- Reconnoitered firing positions
- Exposed firing positions.

The concealed emplacement gives the antitank weapon many advantages over the tank. The gun is ready to fire in a carefully selected and prepared position, giving a maximum field of fire and concealment. However, the enemy must come to the gun. This is the weakness of such an emplacement.

The prepared emplacement is a less effective variation of the concealed emplacement, and is to be used only where the terrain does not permit the gun to be brought to its firing position unseen by the enemy and left there. The gun is held in concealed position of readiness, sometimes only a few yards behind the prepared emplacement.

Reconnoitered firing positions are used where there is uncertainty regarding the direction of a hostile tank attack and where there are different possibilities for the employment of the antitank defense unit. It will be the most usual method for employing antitank guns. In order to be able to reach any of the positions in time, the guns have to be held so far from all of the positions that they will run the risk of arriving late at any one. There will also be difficulty in maintaining communication with the different positions. Necessity, however, compels the use of this method in spite of its weaknesses.

The exposed firing position is used when hostile tanks strike by surprise and must be taken under fire from the position in which the antitank gun happens to be. The unlimbered antitank gun, unarmored, and firing only single shots, will be at a great disadvantage if caught in this position.

The author now briefly discusses the use of these four methods of employing antitank units under different circumstances.

Immediate protection of troops.—On the defensive the antitank guns assigned to the immediate defense of the troops will most often use concealed or prepared emplacements. The nearness of the enemy prevents movement of the piece over a distance which requires more than about a minute. In the attack the reconnoitered firing position will be the rule. The antitank units will follow closely behind the attacking troops by platoon or company, bounding from cover to cover, always ready in case of any mechanized counterattack to move promptly into positions selected beforehand, sometimes by the aid of airplane photographs. For security during the halt, for the security of localities, and for blocking bridges or defiles, concealed emplacements are used. In the delaying action the antitank defense will concentrate on roads and particularly important sectors, the pieces usually going into concealed emplacements. On the march all four possibilities of employment can be visualized. The gun marching with the point and those distributed throughout the columns of foot or horse troops will often have to go into open firing positions against scout cars. Concealed, or at least prepared emplacements, on the other hand, can be used where a tank attack in force is expected. Frequently, however, in this case on account of lack of time, reconnoitered positions will have to be used.

Antitank units of higher commands.—The fundamental and only difference in the employment of the antitank units of higher commands and those assigned to the immediate defense of troops, is that the former may be employed as complete units. The great space that must be covered by the antitank units of higher commands, is partly compensated for by their greater distance from the enemy. On the defensive these units will frequently use prepared emplacements, since the guns must often take positions on bare forward slopes in order to get a field of fire. In the attack the employment will be similar to that of the antitank guns with the troops, that is, movement by bounds from one position in readiness to the next, prepared to go into reconnoitered emplacements. On the march the employment of antitank units of higher commands is similar to that of the units with troops.

The author believes that the same principles of training apply to all the units, with the possible exception that those assigned to the immediate protection of the troops will pay more attention to well chosen positions and to camouflage while the antitank units of higher commands will be more interested in speed and in rapidly going into action.

The pursuit tank is the dream of every member of the antitank troops. This and the many improvements urged in the articles by Lieutenant Nehring and Major von Schnell may some day actually take form. But in the meantime the present equipment retains its effectiveness if the personnel is properly trained.

PRECONCEIVED IDEAS AFFECTING LEADERSHIP

["Des Feldherrn Wunschbild," by General Wetzell. *Militär-Wochenblatt*, 25 August 1936.]

Abstracted by Major E.F. Koenig, Infantry

In this article the author discusses the damage that was done during the World War by commanders who, instead of properly evaluating enemy information, had preconceived ideas as to the hostile intentions.

Even Napoleon, the "God of War", himself, was ruined by preconceived ideas. The campaign into Russia was based on his ideas of Russian resistance and capabilities. At Waterloo he did not believe that Blücher could possibly intervene, after the battle of Ligny. Benedek at Königgrätz, and MacMahon at Sedan likewise were victims of psychological illusions based upon hope.

During the World War, the German First Army was imbued with the conception that the British would land at Zeebrugge and Dunkirk. Thus on 23 August they lost valuable time holding out three corps against an imaginary enemy, and lost the opportunity for a decisive envelopment of the British Expeditionary Force and French Fifth Army. It was the same in Lorraine. No one believed in the French offensive ordered by Joffre, but thought that a "blow on the head" would be adequate, and again missed an opportunity for a decision. The worst case occurred at the First Battle of the Marne, where Hentsch assisted in establishing the idea in each of the flank

armies, that its neighbor was in a critical situation, whereas in reality they were victorious.

Thus preconceived ideas led to defeat on the Western Front, while on the Eastern Front the unprejudiced leaders were able to wring victories from superior hostile forces.

On the Allied side things were even worse. Up to 15 August, Joffre, in spite of definite information to the contrary, would not believe in a German advance beyond the Meuse. His delayed shift of the Fifth Army, and his decision to attack in Lorraine, were all the result of autosuggestion.

In war everything is enveloped in uncertainty, but the leader must always cling to realities, and not be influenced by his hopes and desires, or preconceived ideas he may have. Leadership of armies is not a science, but an art, and in the words of Moltke, the application of common sense to an ever changing situation.

Falkenhayn's illusion was that at Verdun, using much artillery but few combat organizations, he hoped to force Joffre to commit his reserves there, and to be able to give the French a staggering blow. At the same time he figured that the British would be forced to an offensive at the same time as a diversion for Verdun, and that he, using his available general headquarters reserves, could then strike an annihilating counter blow.

In this decision one misses the "Grand Objective," which on the Western Front could only consist in breaking the deadlock of position warfare and to defeat the enemy in mobile warfare. Falkenhayn had no such conception for ending the war.

Germany, at the most, had a reserve of 25 divisions, while the Allies had double that number, and still greater superiority in artillery, aviation, and munitions. With all those handicaps how could Falkenhayn have hoped for success with such a complicated plan of operations?

Schlieffen said: "In war the enemy usually does not play the role that one desires to assign him." A rather sobering thought.

So Joffre did not commit his forces to Verdun and waste his strength in their defense. What if the Germans did capture a few forts? Even the loss of Verdun would not have been a strategic disaster.

Verdun became a blood-soaked field of disappointment; the enemy had failed to cooperate. More and more German forces were thrown into the effort, but always with the hope of achieving a decisive result with the minimum of forces. But why could not Falkenhayn tear himself loose from Verdun?

The answer is one word: "Douaumont."

The heroic victory of a few officers and men became the most fatal gift possible to the German nation. The quick capture of this fortification convinced everyone that heavy siege artillery could accomplish anything. They did not realize that the capture was made possible by the error in judgment of the French commander, who, during a relief, moved his defenses to the outpost line and was overrun and captured before they could organize resistance.

The Falkenhayn idea was considered justified, and this was further confirmed by the partial success of the capture of Fleury.

The reasons for the failure of Falkenhayn's offensive are many. Some of them may be summarized as follows: Choosing the strongest position on the entire French front for the objective. The attack was beyond the strength of the German forces of that day. The troops were neither equipped nor trained for an operation of that kind. The leadership of all echelons lacked unity of purpose. General headquarters had lost touch with the front line and failed to profit from battle experiences. The artillery did not live up to expectations. Even the 420-mm. guns could do nothing to rock foundations and concrete superstructure. They might put the artillery out of action, but the remnants were still defensible by determined commanders.

It was not the weapons which failed at Verdun, but the higher commanders who had been misled to autosuggestion. What did the protests of subordinate commanders amount to, when they always were answered that the capture of Verdun was necessary for strategic reasons. Even reports that units had been reduced to a point where the leader could no longer consider himself responsible, were ignored, and they were ordered to attack, only to fail because the Germans as well as the Allies believed in the all conquering power of the artillery, which was to act like a steam roller and crush all opposition. On the other hand it was never able to completely eliminate the hostile GPFs and machine guns.

Thus Douaumont had terrible consequences.

It is also impossible to understand why the responsible leaders were able to formulate the plan, but which they were unwilling to execute, but delegated this task to the Fifth Army, that is, its Chief of Staff. Thus when the responsible officer had his doubts as to the success and advisability of the plan, and suggested its abandonment, he was driven on by Falkenhayn's illusion. The battles around Verdun so reduced the effectiveness of the German Army that it never fully recuperated from the damage done to it there.

The opening of the Allied Somme offensive dispelled any doubts as to Falkenhayn's preconceived ideas. The dream of Verdun was at end. The decisive point moved from Verdun to the Somme. The initiative was Haig's and Joffre's—it was no longer in German hands.

These failures, the Brussilow offensive in the east, and finally the entry of Rumania into the war, were the causes for Falkenhayn's recall. His legacy to his successors was an extremely difficult situation.

The human tragedies of the second German Chief of Staff were just as great as those of the first. In spite of all his talents, his ability and his readiness to accept responsibility, the task was beyond him.

The lessons to be drawn are primarily that preconceived ideas and the system of intelligence by intentions are the surest companions leading toward defeat. All echelons of command, from the very highest, must retain an open mind, keep their plans and ideas flexible to meet the situation, and to stick to actualities and the sober realities of war. Clinging to an open mind was the principal greatness of Frederick the Great, of Napoleon, Moltke, and also of Ludendorff.

**THE WITHDRAWAL OF THE GERMAN 113th DIVISION
BEHIND THE MARNE ON 19-20 JULY 1918**

["Die Zurücknahme der 113. Inf.-Division hinter die Marne am 19./20. Juli 1918." By General v. Bergmann. *Wissen und Wehr*, April 1936.]

Abstracted by Major G.J. Braun, Infantr.

Due to the stress of combat, the diaries of the division organizations contained little data as to the withdrawal of the

113th Division behind the Marne, 19-20 July 1918. Former members of the division have supplied the information covering this period. This proves the importance of bringing war diaries up to date immediately after a battle, when all data is fresh.

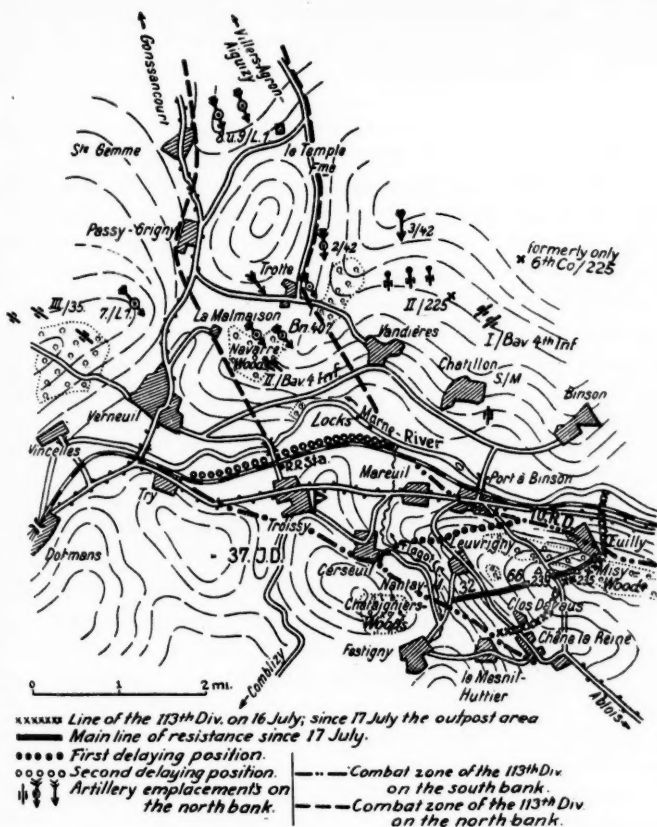
After the successful fighting of the division, instructions were received on the night of 16-17 July to prepare the ground gained for defense, followed by instructions on 18 July to be prepared for a withdrawal behind the Marne. This move was to require two days.

As early as the morning of 17 July the division issued an order to outpost the line reached on the 16th, and to have the main line of resistance passing from the boundary of the sector south of Nantay Mill via Hill 239 in the direction of Hill 235 where it joined the 10th Reserve Division. (See sketch.) This bending back of the front was made in order to connect with the division on its right (37th Infantry Division) whose left flank rested on the eastern edge of Chataigniers Woods. Instructions were that this line should be held at all costs and that the rocky ground was to be organized into strong points. The outpost was to be held by advanced light machine guns. Units were instructed to be echeloned in depth as much as the depleted front-line units would permit and to maintain close contact within the division as well as with the 37th Division and the 10th Reserve Division.

The artillery commander was to report which of the units attached to him were absolutely necessary to carry out his mission. All remaining guns were to be emplaced on the north bank of the Marne to be prepared to provide barrage and annihilating fire.

The division engineer was given the task of the immediate construction of numerous crossings over the Marne, including foot bridges, between Verneuil exclusive, and the locks south of Vandières inclusive. Only one ponton bridge located at the railroad station Troissy was available along this entire stretch of river front at this time.

The Marne crossings in rear of the combatant troops were constantly under hostile fire, and to keep them open and curtail the heavy losses of animals and vehicles an order was issued directing that ammunition and other supplies be unloaded as quickly as possible, to establish dumps and have the vehicles move back to the north bank as soon as possible. The division



trains, including combat trains, ration train and truck columns were to remain on the north bank along the Verneuil—Gousancourt road; the town of Verneuil was not to be entered.

Despite the fact that the troops were completely exhausted and that the regiments had dwindled down so low in personnel that companies comprised of but 20 to 25 men, the position was held against repeated daily attacks by the French who were superior in equipment and numbers.

During the night of 17-18 July the artillery commander started the withdrawal of artillery over the Marne.

The following German artillery had been in position on the south bank of the Marne:

15 batteries field artillery
2 infantry gun batteries
6 heavy batteries.

Of these batteries the artillery commander ordered the 1st and 3d Battalions of the 225th Field Artillery and four batteries assigned as accompanying guns, to the infantry regiments (2 batteries of the 2d Battalion, 225th Field Artillery and 2 infantry gun batteries), to remain in position to provide immediate barrage fire and supporting fire.

The other batteries and their ammunition trains when combined took up about 3.1 miles road space and had to cross over the new ponton bridge at railroad station Troissy, constructed on 16 July; the crossing at Verneuil had become unserviceable. This presents the picture confronting the Germans who hoped that the move would not be detected by the French.

To accomplish the crossing, the Germans moved the various batteries which had been located well to the front, back to the Marne on the evening of 17 July, and two batteries of the heavy artillery moved across to the north bank.

At daybreak on the 18th two more heavy batteries, at dusk one field artillery battery and two heavy batteries, and during the night 18-19 July four field artillery batteries made the crossing. By making good use of cover and avoiding villages which were continuously under fire, the crossings were made without hostile detection.

By noon 19 July, all batteries except those designated for immediate support of the infantry, had crossed to the north bank of the Marne and had gone into the positions as indicated on the sketch.

In addition to the batteries located on the north bank of the Marne under the designation "Marneschutz," the division had one battalion of field artillery and one Landwehr foot artillery battalion attached to it.

The following instructions were given to the artillery units on the north bank in selection of their firing positions:

(a) The organization of a long range group (light and heavy batteries) far enough advanced to be able to effectively engage the hostile artillery.

(b) A second group so located that it would be able to engage any hostile descent to the Marne with harassing and annihilating fire.

(c) A third group so located that annihilating fire could be placed on the river crossings after the German troops had reached the north bank, but to remain silent until called upon.

(d) Selected batteries for flanking fire along the water front should be given special consideration.

(e) Crowding of batteries in the strips of woods having roads passing through them from the bridges should be avoided.

The artillery commander was especially instructed to utilize every possibility to secure flanking fire even though it required selecting firing positions outside the division sector.

The primary mission for the entire artillery on the north bank however, was to provide, whenever necessary, barrage fire in front of the division as long as the positions on the south bank were held.

In the meantime, during the morning of 18 July, instructions were received by the combatant divisions of the Seventh Army to prepare for the immediate withdrawal over the Marne. These preparations involved many considerations by the 113th Division.

The danger was that as soon as the French, who were far superior in number and matériel, detected the withdrawal from the positions between Clos-Davaus and Queilly, would endeavor to annihilate the division on the roads to and over the Marne by utilizing the domineering ridges. The enemy would be able to do this if he employed his strong artillery and numerous attack squadrons in preventing the use of the few river crossings and by severing the connection between the 113th Division and the division on its right (37th Division), by a drive through the Chataigniers Woods where the 113th Division's right flank was in the air.

The difficulty of a retrograde movement lay in the fact that it could not be carried out in a line perpendicular to the front because this would carry it into the sector of the 10th Reserve Division, and to a section of the Marne having but one usable crossing at Port à Binson. In this case it would be impossible to prevent the bunching up of both troops and trains.

On the other hand, the terrain bordering the 4½ miles of road leading up to the river had the advantage of having a good field of fire should it be necessary to take up a position.

The steep slope on the far side of the river bank made the defense against probable pursuit easier should the enemy endeavor to follow closely behind the withdrawing troops.

In consideration of the foregoing it was best to reinforce and echelon the right flank. However, there were not sufficient troops available for this.

It was fortunate that despite the emergency calls from the front lines there were still two battalions of the division reserve (36th Fusilier Regiment) available, although they had suffered heavy losses in their former position of readiness. One battalion was ordered to protect the right flank of the division to the vicinity of Nantay Mill where it was to connect with the hard pressed left flank of the 37th Division at the eastern edge of the Chataigniers Woods.

Another battalion and two companies from the attached Bavarian machine-gun battalion (Poehner) were also moved to reinforce the endangered right flank of the division.

It was therefore essential that the concentrated fire of the artillery be assured on those terrain points from which hostile attacks could be made on the flanks of the division, *viz.*, Clos-Davaus, Chêne la Reine and the roads to Ablois, le Mesnil-Huttier, Festigny and Chataignier Woods, should an effort be made to capture the latter. Necessary preparations for this were made by the artillery commander.

The 113th Minenwerfer Company (brigade reserve) was placed behind the right flank for protection in the direction of le Mesnil-Huttier and Chêne la Reine, and was in communication with the 36th Fusilier Regiment.

On the afternoon of 18 July, division headquarters, which had moved its command post back to la Malmaison, received an order that during the night of 19-20 July the defense was to be transferred to the north bank of the Marne. The entire front was to remain in its present main line of resistance until 10:00 PM, 19 July, after which hour the retrograde movement was to begin.

Based on these instructions, the division immediately issued the following order:

"113th Division
Strictly Confidential

Division Command Post
18 July 1918

DIVISION ORDER

1. The defense by the division and both its neighboring divisions will be shifted to the northern bank of the Marne.

Right boundary on the north bank:

Gonssancourt (inclusive)—St. Gemme (exclusive)
Passy—Grigny (inclusive)—RR station of Troissy.

Left boundary:

Villers—Agron—Aiquizy (exclusive)—Trotte (inclusive)
Confluence of Flagot Brook and the Marne.

2. The withdrawal will take place as follows:

(a) Night of 18-19 July (oral instructions already issued): Withdrawal of all remaining artillery with the exception of the 1st and 3d Battalions of the 225th Artillery and two infantry gun batteries. They will take up positions on the north bank of the Marne in compliance with the instructions prepared by the artillery commander.

Withdrawal of one battalion of the 36th Fusilier Regiment and the machine-gun company, these to take up position on the slope to the north of the stream.

The machine-gun company of the Bavarian Machine-gun Battalion (Poehner) will take up position in accordance with instructions of the 225th Infantry Brigade. The machine guns must be so located that they can directly command the Marne with their fire.

(b) Until 10:00 PM, 19 July, the present front will be defended in its present positions. The barrage and annihilating fire must be delivered by designated batteries from the north bank of the Marne.

Until 10:00 PM reserves will take up a position along the line: south edge of Cerseuil—northwest edge Misy Woods. Contact will be established with the 37th Division at the south edge of Cerseuil and with the 10th Reserve Division on road Port à Binson—Chêne la Reine about $\frac{1}{2}$ mile southeast of Port à Binson.

At 11:00 PM the front lines will start their withdrawal movement and will move back within the division sector and will occupy the railroad embankment.

Security forces will take up positions at the southern exit of Mareuil and Port à Binson during the afternoon.

At 3:00 PM, 20 July, the troops on the line: Cerseuil—northwest edge Misy Woods, will pass through the troops along the railroad embankment which will be occupied until all units have passed through. Arrangements must be made that various railroad embankment positions will be retained as bridgeheads until the night of 20-21 July.

The 225th Infantry Brigade will arrange the details for the occupation of both lines.

The 225th Infantry Brigade will organize the occupation of the north bank of the Marne in such a manner that after the crossing of the 36th Fusilier Regiment and the entire Machine-gun Battalion Poehner (3 MG Cos.), these units can take over the defense in the division sector on that side of the Marne.

3. The infantry withdrawal will be covered by strong combat patrols commanded by officers. These patrols will be equipped with light and heavy machine guns. They will offer tenacious resistance to the enemy. The machine guns will be used until the last moment even at the sacrifice of the guns.

4. The remaining artillery on the south bank will start limbering up at 11:00 PM and will withdraw over the bridge north of Troissy. The artillery commander will direct the order of march.

5. During 19 July everything not needed for the defense will be moved to the north bank of the Marne.

6. The bridge north at the Troissy railroad station will be available for the crossing of vehicles. Should it be destroyed by hostile fire, then these will be routed over a trestle bridge to be constructed by the engineers.

7. The infantry will utilize the foot bridges for their crossing. The commander of the 225th Engineer Company will inform the commander of the 225th Brigade, by the morning of 19 July, of the exact locations of these foot bridges.

8. The bridge and foot bridges are to be dismantled or destroyed upon the completion of the crossing. This will be decided by the commander of the engineers. Orders to demolish the bridges can only be given by officers designated by the commander of the engineers. The latter will be located

at the bridge position north of the Troissy railroad station (telephone connections to Division Headquarters). He will not give the orders for the dismantling or demolition until he has received word from the officer designated by the 225th Brigade as commander of the troops along the railroad embankment, and from both battalion commanders of the 1st and 3d Battalions, 225th Artillery Regiment, that all their forces had reached the north bank of the Marne.

9. Upon completion of the crossing, the Division with its organically assigned artillery will move into the area Coulonges—Vezilly—Arcis le Ponsart as corps reserve. The 36th Fusilier Regiment will remain in position until relieved. The billeting officer will report to G-4 (Ib) at Neuville Chateau at 3:00 PM, 19 July.

10. Secrecy is essential for a frictionless execution of the river crossing. Therefore, all precautions to assure secrecy will be taken.

11. I wish to remind you that no man, horse or vehicle, not even the slightest article of war material, should fall into the hands of the enemy. All captured booty will likewise be taken along. (Immovable captured cannons will be destroyed by demolition.)

12. I expect all officers of the division to use their utmost and unstinted efforts to hold the position until the evening of 19 July and that during the withdrawal behind the Marne they will maintain discipline in their troops so that we may succeed in accomplishing our mission with honor.

13. Division headquarters on 20 July, Neuville Chateau.

(Signed) von Bergmann"

The contemplated withdrawal of one battalion of the 36th Fusilier Regiment on the night of 19-20 July, in accordance with the division order, did not materialize. Due to the employment of a fresh division and numerous tanks by the French in an attack on the evening of 18 July, which was repulsed, the front line felt that it could expect further French attacks. In view of this situation where every man was needed in the front lines, the brigade commander considered it folly to withdraw the only available reserve that was left and therefore ordered that they remain in their position.

Paragraph 9 of the division order was also altered by special instructions on the next day, that the billeting area was only to be reconnoitered but not to be moved into. On 20 July, by order of Corps Conta, the division as corps reserve moved farther to the south.

All other instructions relating to reconnaissance and preparations contained in the division order were carried out during 18 and 19 July.

The Infantry Brigade Commander transferred the responsibility of maintaining the front lines until 10:00 PM, to Captain Zepelin, who commanded the 32d Reserve Infantry Regiment. The following units were placed under command of this officer: 32d Reserve Infantry Regiment, 66th Infantry Regiment, the 3d Battalion, 36th Fusilier Regiment and the 34th Sharpshooter Machine-gun Battalion. He was to conduct the withdrawal

of the front-line troops through the Cerseuil—Misys Woods line at 11:00 PM, and to reconnoiter the railroad embankment position. He was also held responsible for the holding of this position until all troops had crossed the river and to maintain communication with the commander of the Cerseuil—Misys Woods line, the artillery commander of the south bank, and commander of the engineers.

The command of the Cerseuil—Misys Woods line was assigned to Captain Hermens, a battalion commander of the 66th Infantry Regiment. He had at his disposal some weak forces which had been used as reserves, made up of miscellaneous units from the infantry regiments and Poehner's Bavarian Machine-gun Battalion. He was personally responsible in getting these units to their positions, for the holding of the Cerseuil—Misys Woods line until 3:00 AM, for the maintenance of contact with the neighboring divisions, and the final withdrawal of his troops over the Marne. As flank protection behind the right flank he echeloned the 2d Battalion 36th Infantry Regiment. He was assured of communication with the artillery units which were to provide the barrage fire in front of his position.

Major Ewert, commander of the 36th Fusilier Regiment, was assigned by the brigade commander the mission of taking up positions on the north bank of the Marne, for which he had only the following troops available: 1st Battalion, 36th Infantry Regiment, Battalion Staff and 1 company of Poehner's Bavarian Machine-gun Battalion.

Since the front was quiet on the morning of 19 July, the 1st Battalion, 36th Infantry, in accordance with Paragraph 2, Division Order, crossed, in small groups, over the Marne to the north bank where it established an outpost observation line abreast the road Verneuil—Vandières with reserves in the western portion of the Navarre Woods. After both battalions of the 36th Infantry and both of Poehner's Machine-gun Companies had crossed on 20 July, the 2d Battalion 36th Infantry and the Machine-gun Battalion were to assemble at la Malmaison.

Verbal instructions from the brigade command post cautioned the regiments of the necessity of maintaining offensive activity up to the time of withdrawal, especially during afternoon and evening. Simultaneously, the artillery was to furnish energetic bursts of fire on the various portions of the French

front and assembly areas. The headquarters artillery of the battalions remaining on the south bank were to wait until the infantry headquarters pulled out before they dismantled their installations in order to maintain artillery communication.

In addition to previous instructions, the artillery was organized according to their various missions into four groups as follows:

- (a) Group Winterstein.
- (b) Group Steudner.

Both of these were used on the flanks and each had one unit on the south bank and numerous pieces of heavy artillery and field guns on the north bank.

(c) Long range combat group, 144th Artillery (consisting of a battery of long mortars, a battery of 150-mm. and a battery of 100-mm.)

(d) Group "Marneschutz" (3 batteries of heavy field howitzers and 3 batteries field guns). Groups (c) and (d) were in position with all their units on the north bank.

The missions for (a) and (b) Groups (Winterstein and Steudner) for 19-20 July were:

(1) Barrage fire on areas designated by the artillery commander.

(2) Concentrated fire during the evening of 19 July at hours designated by the artillery commander (9:00 PM, 10:35 PM, 11:30 PM) on suspected hostile assembly areas (Clos-Davaus, Chêne la Reine, le Mesnil-Huttier, road to Ablois). During intervening time harassing fire to be placed on the same targets.

(3) Upon request, concentrated annihilating fire by all available batteries of all groups on the above areas and on Festigny and the Chataigniers Woods.

(4) Flanking fire on the southern bank of the Marne in the event of pursuit is to be prepared by batteries from the Navarre Woods against the stretch of the Marne River from the locks south of Vandières to Port à Binson, by batteries from the vicinity of Chatillon against the stretches of the Marne on either side of Troissy.

The missions for the long range group were:

(1) Counterbattery fire; communication with the balloon will be maintained at all times.

(2) Firing on new batteries coming up in the event of a hostile advance after withdrawal from positions.

(3) Participation in the surprise fires designated for 19 July.

(4) When requested, participation in the concentrated fire on hostile assembly areas.

Group "Marneschutz" had the following missions:

(1) Preparation to deliver annihilating fire on the bridge positions in case of enemy pursuit.

(2) For special missions they will be at the disposal of the artillery commander.

On the morning of 19 July, the artillery commander, Major General Hühn, visited his group commanders at their command posts to discuss their missions for the next 24 hours. He wanted to make sure that everybody thoroughly understood the procedure to be followed in the withdrawal.

He also discussed the formations used in the change of position for the units still remaining on the south bank and their conduct during the withdrawal and definitely designated their new locations on the north bank.

Batteries were also designated for the destruction of the bridges, in case the demolitions of the engineers failed in their destruction after the crossing to the north bank had been completed.

Communication with the infantry (not considering the artillery liaison officer) was assured that the headquarters of the battalions of the 225th Field Artillery, which still remained on the south bank, were with the headquarters of the 32d Reserve Infantry Regiment and the headquarters of the 66th Infantry, and through the use of a telephone switchboard in Troissy (the former division CP), communication with the artillery commander and his artillery group commanders was established. Communication with the latter was continually being interrupted, however.

According to the division instructions of 17 July the technical arrangements for the construction of numerous bridges in the section between Verneuil (inclusive) and the lock south of Vandières (inclusive) was the task of Major Rebenisch, Engineers. For the construction he had the following troops available:

Engineer companies from the former division and brigade reserve.

Engineer staff plus three engineer companies which were loaned from other divisions.

The combat strength of these companies, according to the artillery reports, was considerably weakened by losses due to influenza, etc. (for example, the 225th Engineer Company had but 40 men).

Anticipating the destruction of the ponton bridges at the Troissy railroad station by a continuous hostile fire, a trestle bridge for all arms was ordered to be constructed to accommodate the remaining vehicular units of the south bank (machine guns troops, minenwerfer company, medical vehicles, combat trains of the infantry, etc.). A small woods 800 yards up stream afforded excellent cover for the assembling of equipment and the construction of the super-structure. This was also the site of the new bridge. The driving of the piles was done at night and the bringing up of the super-structure was carried out after dusk on the evening of 19 July.

For the infantry crossing seven foot bridges were constructed over the wickets and locks south of Vandières with floating log supports (four between the locks and the woods and three between the woods and the ponton bridges).

Care was taken to prevent hostile aircraft from observing the construction, and the actual floating of the bridge was done at night only. Approaches to and roads from the bridge were reconnoitered and the ones leading from the railroad embankment were marked with scattered straw, because, due to the shortage of engineers, it was impossible to erect road markers. All troop units were instructed as to the problem of the crossing. An officer or noncommissioned officer was designated as commander of each bridge or foot bridge.

At 1:00 AM, 20 July, reports were to be sent to the commander of the engineers on the north bank that the bridges were ready.

All arrangements for the prompt dismantling of the ponton bridge (as soon as the artillery and various vehicular units had crossed) and the removal or destruction of the trestle bridge and foot bridges were made, the execution of which was left to the commander of the engineers. An artillery liaison officer was detailed with him in the event he needed artillery protection during the crossing by the infantry or dismantling process.

All these detailed instructions proved worthwhile. They served as an example of engineer precautions to be taken in a river crossing in face of an enemy of superior numbers.

With all preparations completed for the withdrawal, there still remained the problem of deceiving the enemy as to the contemplated operation in order to permit an unhampered execution of the plans.

There was also the remaining chance that the French might attack before the withdrawal could start.

Air observation reported exceptionally heavy reinforcement of the enemy front line, especially opposite the 32d Reserve Infantry Division. These were subjected to the concentrated annihilation fire from all available batteries which apparently smothered the anticipated French attack before it started.

Gradually in the course of the afternoon the hostile artillery directed by aviation, increased its activity until 9:00 PM when it reached the proportions of a bombardment. About 10:00 PM, very strong French forces attacked against most of the division front, especially opposite the 32d Reserve Infantry Regiment, but despite its fury, gained no ground. During the defense the infantry gun batteries rendered exceptionally effective fire against hostile tanks. Requested barrage fire gave excellent results due to its previous preparations.

This French attack was opportune. The repulse had taken away all desire to renew the attack that night and suited the German plan admirably.

The heavy hostile artillery fire continued until 11:00 PM, and then tapered off until it became an average harassing fire. However, for a long time a heavy fire contained on the Chataigniers Woods lead to the belief that the enemy contemplated a breakthrough at the left flank of the 37th Division, which in turn would jeopardize the right flank of the 113th Division.

The division artillery was therefore assigned to support this flank as much as possible. The anticipated attack did not materialize, however. Therefore the withdrawal was carried out as scheduled, unobserved by the enemy, without casualties.

The 32d Reserve Infantry Regiment, upon reaching a line abreast of Cerseuil, was subjected to vigorous hostile gas shelling, but passed through this zone in good order. Sixty Senegalese prisoners and a captured field piece, which was trailing behind a field kitchen, were taken along by the 66th Infantry

Regiment. The withdrawing troops were well disciplined and under full control of their leaders.

The withdrawal of the batteries from the south bank and the taking up of intermediate positions was begun after 11:00 PM and completed without incident from the enemy.

About midnight the first artillery units (including some batteries of the neighboring 37th Infantry Division) and the infantry combat trains started crossing at Troissy. By 3:00 AM, these batteries had reached the north bank. By 4:35 AM the troops which had been on the Cerseuil—Misny Woods line had passed through the troops on the railroad embankment line.

By 5:00 AM the last infantry units of the division had crossed the Marne foot bridges.

With the exception of two unserviceable infantry guns, all material had been removed from the south bank. Despite enemy artillery fire, the dismantling of the ponton bridge at Troissy was accomplished without incident, the trestle bridge was blown up and the infantry foot bridges destroyed.

Before dawn the hostile harassing fire increased in volume and by 5:00 AM became a vigorous bombardment of the positions which had just been abandoned. It was a grim pyrotechnic display for those who had just left their positions.

The German artillery on the north bank could now place fire on the hostile front lines and assembly areas. During the late morning hours the French attacked the abandoned positions under the protection of a rolling barrage and use of tanks.

Under the protection of the reinforced 36th Fusilier Regiment and its artillery, the division was able to take up its position on the north bank as scheduled.

PROTECTION OF THE REAR OF THE GERMAN EIGHTH ARMY DURING THE BATTLE OF TANNENBERG

["Die Rückendeckung der 8. Armee während der Schlacht bei Tannenberg." By Captain Meier-Welcker. *Militär-Wochenblatt*, 25 July 1936.]

Abstracted by Major E.F. Koenig, Infantry

I.—WHAT HAPPENED IN REAR OF THE GERMAN EIGHTH ARMY FROM 20 TO 31 AUGUST 1914

On the evening of 23 August the army commander decided to move the I Reserve Corps and the XVII Corps to the vicinity

of Allenstein against the Russian Second Army. This left the fortress reserve Königsberg, and the 2d Landwehr Brigade, a total of one and one-half infantry divisions, the 1st Cavalry Division, and local guards for the protection of the Eighth Army against the Russian First Army (Rennenkampf).

The 1st Cavalry Division had had a strenuous time. It had been used for protection of the border, employed on reconnaissance missions, and had taken part in the battle of Gumbinnen. During this battle the division had covered approximately 120 miles, and was located on 20 August in rear of the Russian line, out of touch with the Eighth Army. For that reason this unit did not receive a copy of the withdrawal order.

Not until 8:00 PM, 21 August, did the 1st Cavalry (reinforced by the 2d Battalion of Jägers) regain contact with its Army, and that was after the latter had broken contact with the enemy. On 22 August it reached Insterburg over roads choked with fugitives. The Russians had at last discovered the withdrawal of the Germans, but expected renewed resistance along the Angerapp. The most dangerous unit as far as the 1st Cavalry Division was concerned was the Russian Cavalry Corps under Khan Hussein, which was resting in the area: Spullen—Kussen.

On 22 August the 1st Cavalry Division received orders from army headquarters to screen and cover the move of the XVII Corps and the I Reserve Corps on the line: Darkehmen—Insterburg, and to locate the Russian First Army by reconnoitering towards the line: Possessern—Goldap—Stalluponen—Mallwischken.

In accordance with these orders, the 1st Cavalry Division moved to Jodlauken on 23 August. The condition of the division is best illustrated by its telephonic message to army headquarters on noon that day: "The 1st Cavalry Division has been without Jägers since yesterday. Has had no rest in three weeks. Finally, it went through an attack and a three-day march. Shortage of water, no rations, no forage, horseshoes all consumed, horses exhausted. Only half normal combat effectiveness. Supplies essential, and several days of rest." On that day Rennenkampf advanced. His Cavalry Corps reached Grünheide, after crossing the Inster River. On the south, the Russian 1st Cavalry Division occupied Angerburg. Meanwhile the Reserve Königsberg was covering the entrainment of the German I Corps at Norkitten.

On 24 August the 1st Cavalry Division started its withdrawal on Allenburg, contrary to army orders.

On 25 August the I Reserve Corps and the XVII Corps were moving from the area: Schippenbeil—Friedland to the south. The 1st Cavalry Division advanced to Gerdaunen, with reconnaissance detachments in contact with the enemy. On the north it had a few guard units along the Alle River, south of Wehlau. The Russian cavalry was held up in part along the Deime River, but the mass of the cavalry was moving westward, searching for the German Eighth Army. German security forces were able to delay the advance of the Russians primarily along the railroad lines, and local barricades forced them to avoid the towns.

At noon, 25 August, army orders designated one division of the XVII Corps and the 1st Cavalry Division to furnish protection against the Russian First Army, but by afternoon this order was amended to include the 1st Cavalry Division alone for this mission.

The 6th Landwehr Brigade, located at Lötzen, had been ordered as early as 23 August to move close to the I Reserve Corps. Therefore the 1st Cavalry Division was the only regular army unit to cover a gap of approximately 35 miles from the Masurian Lakes to Königsberg. On 25 August it found it impossible to reach Gerdaunen. The roads were blocked by fugitives.

On 26 August it withdrew before superior Russian cavalry to Schippenbeil. The Russian II Corps, advancing north of the Masurian Lakes, reached the vicinity of Drengfurth. Late that afternoon the 1st Cavalry Division received orders to delay further advance of this hostile unit on Rastenburg—Korschen. The Russian 4th Cavalry Division of the Second Army was already at Sensburg. The mission of the 1st Cavalry Division was to prevent the Russian II Corps from participating in the battle near Gr. Bössau, where the I Reserve Corps and the XVII Corps defeated the Russian VI Corps. On that day Army headquarters were under the impression that there was a strong Russian advance under way. It directed the fortress commander of Königsberg to draw as many Russian troops as possible in his direction.

On 27 August the 1st Cavalry Division moved via Gr. Schwansfeld to Langheim. Strong Russian forces appeared at Rössel and Korschen. The division thereupon withdrew to

Bischofstein. The Russian cavalry was threatening the rear of the XVII Corps, which sent for the protection against them a detachment under Lieut. Colonel von Steinkeller northeast of Gr. Kellen. With the same mission the I Reserve Corps sent the infantry of the 6th Landwehr Brigade back to Lautern. The communications of the XVII Corps had to be shifted towards the west. However, it was soon determined that the Russian cavalry moved to the north from Rössel. The detachment Steinkeller was therefore recalled. The commander of the fortress Königsberg was unable to stop the Russians on the line of the Alle River. The Guard units sent there arrived too late, and the Russian cavalry had already seized the crossings at Friedland and Allenburg. Detachments advanced even as far as Heilsberg and Prussian Eylau.



Advance of the 1st Cavalry Division from 22 August to 1 September 1914.

On 28 August the 1st Cavalry Division advanced to Lautern and then northeast on Rössel. When Russian cavalry appeared from Langheim and advanced on Santoppen, this cavalry merely sited its artillery and the Russians then moved north-

ward. Late that afternoon the Army ordered that one brigade of the division was to be sent to Lötzen "to reconnoiter the terrain east of the lakes, and to determine the location of the Russian II Corps," which unit had been reporting as withdrawing on Grajewo. This order was not executed, for during the night the Army ordered one brigade to Ortelsburg to take part in the pursuit. The remainder of the division was to continue on its present mission.

On the morning of 29 August the 1st Cavalry Brigade started for the south. The remainder of the 1st Cavalry Division remained for the present at Rössel, then moved to Voigtsdorf, where it gained contact with the 6th Landwehr Brigade. At Lautern the division took time out for a rest. It was completely exhausted. A phone call to Army headquarters that afternoon reported as follows: "No distant reconnaissance against the Russian First Army. Horses can barely trot. Close-in reconnaissance." This condition of affairs was particularly serious as the Russian threat towards Allenstein was being felt. In spite of all difficulties the 1st Cavalry Division was able to prevent the Russian 1st Cavalry Division from reaching their march objective: Seeburg—Bischofsburg. It only advanced as far as the area east of Bischofsstein.

On the morning of 30 August the 1st Cavalry Division received radio orders from army headquarters as follows: "Everything depends upon your holding up the enemy reported at Rössel, regardless." On this day the bulk of the division moved to Rothfiess.

During the night of 30-31 August the Russian 1st Cavalry Division made a thrust in the direction of Allenstein, which was the only far-reaching and large scale operation of the cavalry of the Russian First Army during the battle of Tannenberg. But it was too late. On the morning of 31 August there was a skirmish between them and the units of the 6th Landwehr Brigade and the 1st Reserve Hussars. The Russians were easily brushed aside. That afternoon the 1st Cavalry Division received orders to move to the north and to cut off the hostile cavalry division. "Relentless pursuit" was ordered. The 1st Cavalry Division then advanced to Lautern. On 1 September it struck hostile cavalry near Kiwitten. After a brief fire fight the Russians withdrew to the north. The cutting off of the Russian cavalry did not succeed. The German cavalry pursued as far as Gr. Schwansfeld, mostly with artillery fire.

On the front of the Russian First Army the few Landwehr and railroad and bridge guards were unable to offer delay to the advancing Russians. In some cases the Landwehr withdrew with astounding celerity. One Landwehr Battalion withdrew 42 miles in 24 hours. Such troops as were sent out from the cities along the Vistula, such as Danzig, were placed under the command of Lieut. General von Heuduck and were deployed along the Passarge River. On 31 August parts of the Russian 2d and 3d Cavalry Divisions approached the Passarge, and were met by a mixed detachment, which went to Wormditt and held them up in a fire fight lasting several hours. When a small German detachment on bicycles and in automobiles appeared from Braunsberg on the north flank of the Russians, the latter withdrew towards the east during the early evening hours.

The fortress Königsberg had been engaged in an artillery duel since 28 August. As the Russians were pressing from the east, the commandant could not spare enough forces to attack towards the south and threaten the flank of the Russian First Army. Strong Russian forces were contained just the same by the fortress.

II.—DISCUSSION AND CONCLUSIONS

Three factors furnished the protection to the rear of the German Eighth Army: The fortresses Königsberg and Lötzen; the 1st Cavalry Division; and the Landwehr and guard units, detailed to impede the advance of the Russians.

Had the Russian First Army intervened, the German Eighth Army could not have defeated the Russian Army decisively. The containing of the Russian First Army was therefore of decisive importance. The units employed did what they could under conditions of that date. Unquestionably the holding forces would not have been so weak, had the Russian First Army taken the offensive, and had come energetically to the assistance of the Second Army. It is well known that the actions and orders of the commander of the Russian Northwest Group of Armies, and the commander of the First Army, were based on a faulty estimate of the situation. They assumed the German Eighth Army to be withdrawing to the Vistula after the battle of Gumbinnen. As the Germans had succeeded in breaking contact, the Russian high command did not believe that a frontal pursuit could be successful. It also did not like

the threat of the fortress Königsberg to the north of the Russian First Army. The Russians planned "ahead" and had already considered a shift of their First Army to Poland to assist in the large scale invasion of Germany. Other circumstances may have contributed also to the lack of aggressiveness on the part of Rennenkampf's army. For one thing, the supply situation was very binding. It had been the brake on Russian strategy during the entire campaign.

When finally the Russian First Army started to make a half-hearted attempt at succor to their Second Army, it was too late.

Undoubtedly the German command attempted to cut down the forces detailed to contain the Russian First Army to the irreducible minimum. In this lay the greatness of German leadership.

The fortress Königsberg had no small influence upon Russian operations. Its troops had made the entrainment of the German I Corps possible. The fortress with its far-reaching fortifications drew considerable Russian forces. Lötzen did not hold any considerable force of Russians in front of it. Had there been additional fortifications in the 25-mile gap between these two fortresses, they would also have been of decided value.

In view of the fact that the screening of troop movements after the Battle of Gumbinnen was of vital importance to the Eighth Army, we must admit that the 1st Cavalry Division and the Landwehr and guard regiments accomplished their mission successfully. It seems almost unbelievable that the Russian cavalry, five and one-half times the strength of the German, was incapable of carrying out its mission of reconnaissance and was unable to locate the German Eighth Army, for the Russian cavalry of 1914 was efficient and possessed high morale. We can understand how the Russian aviation failed, for it was worthless, and greatly inferior to the German aviation. The Russians also made no attempt to utilize the East Prussian telephone communications net. The only thing they did, was to destroy the telephone exchanges at the various Post Offices, hoping thereby to disrupt German communications. At that they were only partially successful. The German postal officials remained at their stations frequently long after the Russians had entered the town, and found means of restoring communications, even after the destruction of the switchboards.

Although it was possible to defeat the Russian Second Army decisively in 1914, while another Russian army was in immediate proximity, free to move where it wanted, such an operation would hardly be possible under modern conditions. Modern aerial reconnaissance, quick communications, and the availability of large, mechanized forces appear to render any such operation as impracticable today. Still it might be feasible, provided the protection of the communications is adequately provided for. Of course, this would require an entirely different arrangement of forces as was the case in 1914.

A modern cavalry division will find employment on such a mission. With it there will have to be tanks and pursuit tanks, which, with their high degree of mobility, fire-power and combat effectiveness, could furnish an efficient defensive force to all threatened points.

In addition to these mobile, active defenders, there will be, just as in 1914, the local guards who can do a great deal by means of demolitions and obstacles, especially if they concentrate their activities behind the natural defensive terrain features, especially rivers, running from south to north through the terrain. Also motorized engineers will assist in erecting road blocks and similar obstacles. There are also missions for machine-gun battalions. They will have to be reinforced by antitank units. By means of gas, large areas can be contaminated and rendered untenable to the enemy, and thereby increase the defensive power of relatively weak organizations. In this manner one would create an obstacle zone, which would prevent any reconnaissance by the Russian First Army.

On the other hand, the Russians, after the battle of Gumbinnen, would assume the offensive with strong motorized and mechanized forces as well as with cavalry divisions of great fire-power. The defender would then have to take advantage of his motorized units and their mobility, thereby escaping the most pressing of the dangers threatening him, and increase the effectiveness of his small force manifold.

So it appears to us that even under modern conditions it might be possible to screen the movements of the German Eighth Army from the eyes of the Russian First Army for a few days, by taking full advantage of all the defensive power of modern weapons and organizations.

Far more difficult is the screening of the operations against air observation. All marches toward the Russian Second Army

would have to be executed under cover of darkness, and corresponding forward movements against the Russian First Army simulated. Dummy radio activity might in addition assist in misleading the enemy.

In addition, the rear of the Eighth Army would require a strong antiaircraft defense. Most important would be the maintenance of aerial supremacy. By reducing all air missions on the front of the Second Army to the minimum, every available plane should be employed in operations against the First Army. The possession of interior lines by the Germans would of course prove a huge advantage in such an operation. They would have been immediately reinforced from the zone of the interior.

In estimating the forces which might be necessary to guard the rear of the Eighth Army one must always bear in mind that the principle which guided the Eighth Army in its dispositions was to leave the least possible number of troops opposite the Russian First Army. This was the basic scheme of the battle of Tannenberg. Thus it was as strong as possible for its battle with the Russian Second Army, and even under modern conditions we would only leave the most necessary and essential units to guard the rearward communications and against the First Army. They would have to be stronger than the forces that were left behind in 1914, and their composition would be much more complex. In the case of the antiaircraft artillery and the aviation the mass would even be facing the Russian First Army, at least for the first few days after the battle of Gumbinnen.

Under such conditions the battle of Tannenberg seems practicable even today, based upon the strategic conceptions of August 1914.

THE SUPPLY OF THE FAR EASTERN SOVIET ARMY

["Die Versorgung der fernöstlichen Sowjetarmee." By Erwin Haudan. *Wissen und Wehr*, July 1936.]

Abstracted by Major G.J. Braun, Infantry

Due to its extreme remoteness, the defense of the Far Eastern province of Soviet Russia presents a great problem. To properly understand this problem it is necessary to note the Far Eastern set-up. Here we have:

(1) An oceanic country which, during the past forty years, has gained a foothold on the Asiatic mainland and successfully forced its political and commercial influence continually farther inland, developing a continental buffer state, namely, Japan.

(2) An outspoken continental power—self-styled as the greatest in the world—which has instilled in its province a renewed civil, industrial and military life, and is now endeavoring to reestablish her political military influence in the Far East, namely, Soviet Russia.

(3) A third country—the most populous country of the world—which is suffering from the aggressions of the two previously mentioned nations, is again in danger of losing more of its outlying provinces, namely, China.

The military and political differences of Japan and Russia are unreconcilable and will eventually end in a rupture of relations. When and in what form this may occur cannot be foretold.

The province occupied by the Far Eastern Red Army differs, due to unusual geopolitical and industrial features from any other province of the Soviet Union. Its exposed position on the Pacific Ocean is close to its neighbor, Japan. The distance from the Russian industrial center (Moscow) to Chabarowsk is 5,270 miles, whereas the distance from Tokyo to Vladivostok is but 682 miles. Its meager population, inadequate transportation and communication net remain dominant factors in adding to the difficulties of organizing the defense of that province. In the north, road traffic is impossible due to its geographical location, raw climate, tundra and taiga (grassy and wooded regions), and numerous rugged mountain ranges and plateaus which are intersected by ravines. To the south there are swamps and woods affording but little terrain suitable for agriculture. It is in this narrow area that the population is concentrated, where industry and commercial traffic is carried on. Through it the main artery of transportation passes, the Trans-Siberian Railroad. Also through this zone the essential raw products pass from the outlying and exposed areas to be manufactured into usable articles.

The 1935 Statistical Yearbook of Soviet Russia states that the military zone of the Far Eastern Army covers about 5,620,000 square miles, with a population of about 6,000,000 people. The Far Eastern Army, commanded by Marshal Blücher consists of about 250,000 men, and according to press

reports, is organized into 12 infantry divisions, two cavalry divisions and one independent cavalry brigade. The military headquarters is located in Chabarowsk on the Amur River. Other headquarters are located at Vladivostok, Blagoweschtschensk, Tshita, Irkutsk, Krasnojarsk, as well as at Spassk and Woroschilowsk on the Ussuri. The bulk of troops are located along the coastal area and in the bend of the Amur. These areas represent the military strong points and also the most vulnerable part of Far Eastern Russia.

The Far Eastern air armada is reported to consist of 600 planes, although many reports state 800 to 1,000 planes, of which 100 are heavy bombers with great cruising radius.

Great progress has been made in recent years in the motorization and mechanization of the Far Eastern Army. In addition to 800 tanks and armored cars in independent organizations, the army has available a far-reaching motorization of individual divisions, headquarters and special troops.

According to reports of last year, the Far Eastern naval force consists of many destroyers, about 50 submarines, 2 torpedo boats, 12 gun boats, a great number of river gun boats and coast patrol boats, as well as mine layers and trawlers. The principal mission of these is coast defense and the protection of navigation and fisheries.

For the individual soldier the defense of the Soviet Union is his main mission but the army, in fact, has political objectives and missions in addition to the defense of the U.S.S.R., namely, the exploitation of Bolshevik imperialistic tendencies in Asia.

From the military viewpoint the mission of maintaining the Amur and Ussuri regions is to retain these as buffers against Japan and a flanking position against Manchuria and Japanese expansion on the mainland. The militarization of the Soviet outpost, Outer Mongolia, by the Red Army can also be considered a second feint against Manchukuo—Japan, with the object of relieving the Japanese pressure on the Ussuri—Amur territory.

In analyzing the military requirements of this modern army and its supply, the following fundamentals must be considered: An army whose strength remains about the same has requirement variations due only to the organization of its components, its equipment, armament, and missions, also according to the military geographic conditions under which they would be employed in the event of war.

How these requirements vary can be seen from the following example: Based on experience gained from the World War, the estimates, according to writers such as Triandafilow, Schwarte, Culman and Basarewski for the supply of a 15 to 18 division army were 28, 36, 60 and 74 railroad trains per day. These variations in estimates are due to different military and military-geographic assumptions made by these researchers.

In addition, the requirement of a modern army depends on the degree of its technical equipment, *i.e.*, motorization and mechanization create in themselves an increased and extremely important requirement of fuel for the operations. The main effort of military supply since the World War is centered in meeting the increased ammunition requirements.

For three years articles based on commercial data appeared in the military periodical, *Woina i Revoluzija*, giving a workable requirement and analysis for the matériel supply of a modern army. In one of these articles Triandafilow assumed the strength of an army to be 16 divisions which was about the same in size as that of the Far Eastern Army. The industrial and transportation facilities, the military-geographic conditions and the assumed contemplated operations were so similar to those of the Far Eastern conditions that the estimate made from this investigation could be applied to the Far Eastern Army.

Munitions: The ammunition estimate of the Soviet Russian investigation was based on the various phases of the combat operations. First, he assumed there would be border skirmishes in the form of meeting engagements. In the second phase, he considered a breakthrough successful in penetrating the hostile fortified boundary zone. In this phase the enemy had withdrawn to where its reserves of the second echelon were assembled. The third operation phase was the final breakthrough to the extreme rearmost hostile fortified zone where it was assumed the hostile third echelon forces were encountered.

Based on the above assumption, the Russians have figured out the daily munitions expenditure, summarizing the combat operations of the first month as requiring the supply of about 19 days of fire. The transportation of one day's fire requires 18 railroad trains of 30 cars each, or about 450 to 480 tons per train. In addition, it was considered that the munitions requirement of the military operations came spasmodically and could be divided as follows for the first month:

10 days combat using one day of fire per day, or 18 trains per day

16 days combat using $\frac{1}{2}$ day of fire per day, or 9 trains per day

4 days combat using $\frac{1}{4}$ day of fire per day, or 5 trains per day.

The monthly replacement of rifles and light machine guns during the World War on the Russian Front was about 6%; the supply of heavy machine guns and field pieces about 5%. For the replenishment of losses in infantry and artillery weapons therefore, it is estimated that 2 to 3 freight cars would suffice.

Rations and forage: The requirement of rations and forage of an army, not considering the consumption of the additional rations and local purchases, continually fluctuates and is based entirely on the numerical changes in the strength of the army.

In addition to this the arms, such as the infantry, cavalry, artillery, motorized and mechanized units, aviation, and auxiliary troops have great variations in requirements. The total ration and forage requirements of the Far Eastern Army can be estimated as 8 trains per day.

Fuel (gasoline): In calculating the fuel (gasoline) requirements for the motorized and mechanized forces of the Far Eastern Army, the number of motorized vehicles and their average daily performance must be considered. A medium day's performance for wheel trucks can be given as 62 miles per day and for tractor type vehicles at 31 miles per day. According to Russian estimates, a day's fuel requirement for a reinforced infantry corps (less corps troops) is 175 tons or 9 railroad cars, the equivalent of $\frac{1}{3}$ of a railroad train. The requirement of corps troops (aircraft, motorized and mechanized battalions, light truck trains, etc.) is equivalent to the requirement of three infantry corps so that a modern day's consumption of the entire army is given as 1,200 to 1,300 tons, or the equivalent of 3 railroad trains of 400 to 430 tons each.

Truck and armored car material: In addition to the approximate 800 vehicles of the tank battalions, the Far Eastern Army possesses trucks of all description for transport and supply service. For the maintenance of these trucks the combined supply of tires, replacement parts, new motors, etc., is estimated at one railroad train per day.

Engineer equipment: Engineer material for the construction of barracks, depots, camouflage, road construction and

repair will be required. The day's requirement of this type of material is estimated as 30 to 35 car loads which is the equivalent of one railroad train. This requirement is materially increased during a defense.

Chemical material: In a future Far Eastern war a great quantity of chemical material will be required offensively and defensively in air attacks, in preparing or neutralizing gassed areas and for camouflaging by creating artificial fog (smoke screens). The amount and urgency of this requirement depends on the use of aviation and is therefore difficult to estimate.

Railroad material: The requirement of railroad material (rails, ties, rubble stone, bridge material, etc.) is dependent upon the number of railroad lines to be constructed in an advanced sector, the extent and type of hostile destruction and the required speed of the restoration work. As an average, the restoration of 6 miles of railroad requires 4 trains of construction material.

Troop replacements: This depends entirely on the anticipated casualties. According to Triandafilow, the Soviet estimate for the initial operations call for 10 to 15% casualties, for the remaining days of the first combat month, 20 to 30% casualties. This represents an unusually high per cent of casualties in an army of 250,000 men, which would range from 75,000 to 110,000 men for the month and represents a daily requirement of 2,500 to 4,000 men replacement which is the equivalent of 2 to 3 railroad trains.

Horse replacements: Utilizing the Russian casualty reports of the World War, 1 to 1½% represents the daily loss of animals. In an army of this size it would mean a replacement of from 500 to 700 horses, requiring 2 to 2½ trains.

The total requirement based on the Russian estimate would be as follows:

Ammunition supply.....	5-18	trains daily
Rations and forage.....	5-18	trains daily
Fuel (gasoline).....	3	trains daily
Technical material.....	3	trains daily
Railroad material.....	4	trains daily
Miscellaneous requirements.....	½	train daily
Troop replacements.....	2-3	trains daily
Animal replacements.....	2-2½	trains daily

Medical Corps trains.....	2	trains daily
Railroad operation	2	trains daily
<hr/>		
Total.....	28-40	trains daily

THE REASONS OF ITALIAN SUCCESS

["The Last Days of Abyssinia: The Downfall of One of the Oldest Kingdoms in the World." By Lieut. Colonel Charles F. Rey. *The World Today*, December 1936.]

Abstracted by Major F. During, Infantry

The military success of the Italians must be held to be due to a variety of causes. Among these it is probable that the two factors which in popular opinion played the largest part in securing victory, *i.e.*, the use of mustard gas and air bombing, were in fact the least effective.

From a purely military point of view, probably the most potent factor was the realization by the Italian general staff that the main enemy they had to fight was the country itself, its natural features of rugged and precipitous mountains, deep valleys, and its complete lack of roads.

They therefore employed tens of thousands of men on road construction, and provided an immense fleet of motor transport of the most efficient character, thus enabling them to transport and concentrate their troops with great rapidity, to feed them, and to maintain their long line of communication.

The Abyssinians, possessing neither supply depots nor transport, thus lost their main advantages, *i.e.*, the difficult nature of a country for an invader, and rapidity of movement.

The Italians made the fullest possible use of mechanized war material (as distinct from mere transport) and their huge fleet of aeroplanes, and very large numbers of tanks specially designed for use in hill country, proved of the utmost value for scouting and mapping, and even for helping to maintain advanced posts by food distribution, as well as for the actual fighting.

And of equal importance in bringing about the final victory, was the extraordinarily efficient secret service of the Italians, which by means of espionage, propaganda and lavish distribution of money sowed dissention among the Abyssinian

Chiefs and Sub-Chiefs, and kept the Italians fully posted as to every Abyssinian movement.

As regards the use of mustard gas and air bombing, it has been publicly stated by the Turkish General Wehib Pasha, Chief of the General Staff of the Southern Abyssinian Army, that though a contributory cause to defeat, the mountainous nature of the country prevented gas from being very effective (as effective as in the war in France, for example), and that after a time the Abyssinian troops soon became indifferent to the extensive air bombing that was practiced. The use of gas was, however, doubtless demoralizing, and air bombing in the pursuit of defeated troops after the main Italian victories was the most effective form of the use of this weapon of war; but their value as factors of victory appears to have been very much less than popularly supposed.

Finally, General Badoglio's strategy seems to have been of a high order, and to have been admirably adapted to the special nature and needs of such a campaign.

I
article
S
viatio

Army
Fight
Journ
Journ

Army
Bulle
Canac
Militi
Militi
Reser
Revu
Revu
Wisse

Revu
Roya

Const
Field
Journ
Revu
Rivis

Cava
Revu

Chem

Milit
Pioni
Revu
Rivis
Roya

Section 3

DIRECTORY OF PERIODICALS

Included in this directory are only those periodicals from which articles have been selected.

See also, Section 7, "List of Periodicals Indexed and Key to Abbreviations."

MILITARY AND NAVAL PERIODICALS

Joint Forces	Page
Army, Navy and Air Force Gazette (Great Britain).....	97
Fighting Forces (Great Britain).....	105
Journal of the Royal United Service Institution (Great Britain).....	106
Journal of the United Service Institution of India (Great Britain—India).....	107

General Military

Army Quarterly (Great Britain).....	99
Bulletin Belge des Sciences Militaires (Belgium).....	99
Canadian Defence Quarterly (Canada).....	104
Militärwissenschaftliche Mitteilungen (Austria).....	107
Militär-Wochenblatt (Germany).....	108
Reserve Officer.....	130
Revue Militaire Francaise (France).....	138
Revue Militaire Suisse (Switzerland).....	139
Wissen und Wehr (Germany).....	151

Arms and Services

AIR ARM

Revue de l'Armée de l'Air (France).....	130
Royal Air Force Quarterly (Great Britain).....	144

ARTILLERY

Coast Artillery Journal.....	105
Field Artillery Journal.....	105
Journal of the Royal Artillery (Great Britain).....	106
Revue d'Artillerie (France).....	132
Rivista di Artiglieria e Genio (Italy).....	144

CAVALRY

Cavalry Journal.....	104
Revue de Cavalerie (France).....	133

CHEMICAL SERVICE

Chemical Warfare Bulletin.....	105
--------------------------------	-----

ENGINEERS

Military Engineer.....	127
Pioniere (Germany).....	128
Revue du Génie Militaire (France).....	137
Rivista di Artiglieria e Genio (Italy).....	144
Royal Engineers Journal (Great Britain).....	145

INFANTRY	
Infantry Journal.....	105
Revue d'Infanterie (France).....	135
MEDICAL	
Army Medical Bulletin.....	97
Journal of the Royal Army Medical Corps (Great Britain).....	106
Military Surgeon.....	127
ORDNANCE	
Army Ordnance.....	98
QUARTERMASTER	
Quartermaster Review.....	129
Royal Army Service Corps Quarterly (Great Britain).....	144
SIGNALS	
Signal Corps Bulletin.....	151
TANKS	
Sanct Christophorus (Germany).....	145
VETERINARY	
Veterinary Bulletin.....	151
Navy and Marines	
Marine Corps Gazette.....	107
Naval Institute Proceedings.....	128
General	
Foreign Affairs.....	153

Section 4

CATALOG OF SELECTED PERIODICAL ARTICLES

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this Catalog are arranged alphabetically.

ARMY MEDICAL BULLETIN

October 1936

- (1) CAUSES OF DEATH; U.S. ARMY COMPARED WITH THE C.C.C.

ARMY, NAVY AND AIR FORCE GAZETTE (Great Britain)

22 October 1936

- (1) HITLER AND THE GERMAN ARMY. Major-General Fuller
- (2) THE HIGHWAY OF WAR. Sinclair

29 October 1936

- (3) FOOD SUPPLIES IN TIME OF WAR. Brereton
- (4) THE REALITY OF AIRSHIP VULNERABILITY. Captain Sinclair

5 November 1936

- (5) GERMANY AND FRANCE—THE TWO ARMIES. Captain Macnamara

12 November 1936

- (6) MOBILITY AND FRUGALITY. Major Shaw
- (7) LIGHTER-THAN-AIR POLICY. Captain Sinclair

19 November 1936

NOTE: With this issue the name of this periodical becomes:

"THE UNITED SERVICES REVIEW"

- (8) THE VINDICATION OF GENERAL GOUGH
- (9) THE FLEET AIR ARM. CONTROVERSY AS TO ADMINISTRATIVE CONTROL. Sir Herbert Russell
- (10) THE AIRCRAFT FACTOR IN WAR. BRINGING THE CIVIL POPULATION INTO THE QUESTION. Air Commodore Charlton

26 November 1936

- (11) ENGLAND AND ITALY IN THE MEDITERRANEAN
- (12) REARMAMENT AND THE FUTURE
- (13) MEANING OF SEA POWER. Sir Herbert Russell

3 December 1936

- (14) A BELGIAN BRIDGE-HEAD AND COMMERCE DEFENCE. OUR WEAK POINT IN TIME OF WAR. Lieut.-Colonel Blacker
- (15) "THE FIRST LINE." SEA POWER STILL SUPREME. Sir Herbert Russell

10 December 1936

- (16) AN EXAMINATION OF AIR PARITY. Air Commodore Charlton
- (17) CONTROL OF THE FLEET AIR ARM. ADVANTAGES AND DISADVANTAGES OF THE PRESENT ARRANGEMENT. Air Commodore Fellowes

17 December 1936

- (18) AIR INFANTRY. HOW CAN THIS DEVELOPMENT ASSIST GREAT BRITAIN? Major-General Rowan Robinson
- (19) BACK TO REALITIES. FAITH, HOPE—AND GAS MASKS FOR ALL. Sir Herbert Russell
- (20) THE INFLUENCE OF AIR POWER. READAPTABILITY TO THE AIR AGE. Air Commodore Charlton

24 December 1936

- (21) MILITARY GEOGRAPHY AND AERIAL WARFARE. NECESSITY FOR RECASTING OUTWORN PLANS. Air Commodore Charlton
- (22) STRATEGICAL CO-ORDINATION. Sir Herbert Russell
- (23) COMMON-SENSE MILITARY TRAINING
- (24) USE OF NEUTRAL FLAGS IN WAR. SOME OUTSTANDING EXAMPLES FROM PAST HISTORY. Lieut.-Commander Saul

31 December 1936

- (25) IN CHESAPEAKE BAY. THE SINKING OF THE EX-GERMAN DREAD-NOUGHT OSTFRIESLAND. Air Commodore Charlton
- (26) AIR POWER IN THE PACIFIC. WHOSE FUNCTION TO PROTECT TRADE ROUTES?

7 January 1937

- (27) THE DOUHET DOCTRINE. NATIONAL SECURITY AND A POWERFUL AIR FORCE. Air Commodore Charlton
- (28) "LIMITED LIABILITY" WAR. Colonel Beadon
- (29) WAR'S THREE DIMENSIONS. CHANGING VALUES AND OLD PROPORTIONS. Sir Herbert Russell
- (30) GAS RESPIRATOR PROTECTION. NECESSITY FOR INSTRUCTING CIVIL POPULATION. Major Murphy

14 January 1937

- (31) SEADROMES AND THEIR FUTURE. Air Commodore Charlton
- (32) VULNERABLE NAVAL BASES. CAN WE AFFORD TO RELINQUISH THEM? Sir Herbert Russell

ARMY ORDNANCE

November-December 1936

- (1) TOTALITARIAN WAR. THE THREAT OF SWIFT AGGRESSION TO COLLECTIVE SECURITY. Major General Fuller
- (2) GRAND STRATEGY OF 1914-1918. ITS EFFECT ON FUTURE INDUSTRIAL MOBILIZATION. Captain Puleston
- (3) THE GERMAN ARMY. MILITARY ORGANIZATION OF THE THIRD REICH. Laurent
- (4) MILITARY MOTOR TRANSPORT. THE DEVELOPMENT AND COORDINATION OF MOTOR-TRUCK FLEETS. (II) Colonel Taylor
- (5) SHERIDAN'S CAVALRY AT APPOMATTOX. THE CLIMAX IN A WAR OF MANEUVER. Colonel Edwards
- (6) WHAT PRICE AUTOMATIC? COMMENTS ON THE DEVELOPMENT OF A NEW ARM. (II) Lieutenant Johnson
- (7) THE WORLD WAR IN HISTORY. A SURVEY OF SOURCE MATERIALS IN THE HOOVER WAR LIBRARY. Lutz
- (8) ARMY ORDNANCE SERVICE. Part I. Lieut. Colonel Marsh

January-February 1937

- (9) MILITARY SUPPLY OF LARGE UNITS. SOME PRINCIPLES OF MOBILIZATION, LOGISTICS, AND CONTROL. Major General Moseley
- (10) THE FRENCH ARMY TODAY. NEWLY MECHANIZED UNIT FORM ITS FIRST LINE OF DEFENSE. Captain Liddell Hart
- (11) TANKS AND TACTICS. A DISCUSSION OF MECHANIZATION AND AUTOMOTIVE ORDNANCE. Major Christmas
- (12) PRIVATE MANUFACTURE OF ARMS. Sir Charles Petrie

Periodical Articles—Catalog

- (13) THE THIRTY YEARS' PEACE. AN INTERLUDE IN THE HISTORY OF THE UNITED STATES ARMY. Colonel Spaulding
- (14) GERMAN SMALL ARMS AND AMMUNITION. CURRENT TRENDS IN DESIGN AND DEVELOPMENT. Lieut.Colonel Goddard
- (15) ARMY ORDNANCE SERVICE. Part II. Lieut.Colonel Marsh

ARMY QUARTERLY (Great Britain)

January 1937

- (1) MAN-POWER AND DEFENCE. EUROPEAN "SPORTS" POLICIES—BRITAIN'S PROBLEM. Lieut.-Colonel Seton Hutchison
- (2) OUR RECRUITING PROBLEM AND A SOLUTION. Major-General Fuller
- (3) NOTES ON THE TERRITORIAL ARMY IN EREWHON. Major Wardle
- (4) A NOTE ON BRITISH NATIONAL STRATEGY, PAST AND FUTURE, AS REGARDS THE USE OF LAND FORCES IN TIME OF WAR. Major-General Bird
- (5) MESOPOTAMIA. (II) Captain Kirkby
- (6) THE FUTURE OF LAND WARFARE. Lieut.-Colonel Maitland-Dougall
- (7) THE NIGHT OF FEROZESHAH, 21ST-22ND OF DECEMBER, 1845. AN ACCOUNT BY AN EYE-WITNESS: WITH NOTES. Sir Charles Oman
- (8) THE RECRUITING PROBLEM OF THE BRITISH ARMY. By A Decurion
- (9) RECRUITING STAGNATION: A YOUNGER VIEW. MacLennan
- (10) WEAPON AND TARGET. Lieut.-Colonel Macky
- (11) THE EDUCATION OF THE OFFICER. Colonel James
- (12) A GERMAN GENERAL ON THE MARCH, 1918, OFFENSIVE
- (13) BULGARIA'S ARMY OF POLITICIANS. Brown
- (14) TANKS IN THE CHACO WAR

BULLETIN BELGE DES SCIENCES MILITAIRES (Belgium)

By Captain Wendell G. Johnson, Infantry

July 1936

- (1) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918: L'ATTAQUE DE LA TRANCHÉE DU KWAEBEK PAR LE 3^e RÉGIMENT DE LIGNE (9 SEPTEMBRE 1918). [History of the Belgian Army in the World War: Attack of Kwaebeek trench by the 3d Infantry (Belgian), 9 September 1918.] Lieut.General de Callatay

A brief account giving the battalion missions and the participation of individual companies and even platoons.

- (2) LES OPÉRATIONS MILITAIRES À LA FRONTIÈRE EST DE LA PROVINCE ORIENTALE PENDANT LA CAMPAGNE 1914-1918. [Military operations in Belgian East Africa, 1914-1918.] (III) Lieutenant Bayot

Continuation of serial article on Belgian participation in the East African campaign.

- (3) EXERCICE DE FRANCHISSEMENT DE LA MEUSE À MARCHE-LES-DAMES. [Crossing of the Meuse at Marche-les-Dames, 16 July 1935.] Captain Schneider

Description of river crossing made by the 2d Chasseurs (Cavalry) and the 13th Infantry with the aid of the 3d Battalion 4th Engineers and air observation. Complete with sketches and photographs.

- (4) L'ARMÉE NORVÉGIENNE. [The Norwegian Army.] Lieutenant Agourtine

Norway has six regions, each with one division of troops. These divisions contain two or three infantry regiments, a cavalry regiment with a cyclist company, an artillery regiment, a divisional school, a sanitary company, and a quartermaster company. Several divisions also have an engineer battalion, and a group of mountain artillery.

An infantry regiment consists of: a headquarters, three active battalions, one reserve battalion. Each battalion has three rifle companies and a machine-gun company of nine guns. There are eight battalions that have only three companies. Five regiments have a cyclist company each. These units become ski companies in winter. Each rifle company is

divided into three platoons each of two combat groups subdivided into half groups. In all, there are 16 regiments and the Royal Guard battalion in the Norwegian infantry.

The cavalry comprises three dragoon regiments and one "Landvern" squadron. Each regiment has four squadrons, one of which is a machine-gun squadron with nine guns, a cyclist company, an armored squadron of nine vehicles, and a platoon of mortars.

The artillery consists of three field artillery regiments, three mountain artillery groups, a regiment of antiaircraft artillery (60 pieces), and a section of fortress artillery at Fossum. Each field artillery regiment has a group of mountain artillery, a group of howitzers, and a reserve field artillery group. Field and mountain artillery have 75-mm. pieces; howitzers and fortress artillery, 120-mm. pieces.

Norway has a fleet of 96 airplanes of Dutch Fokker and British Mott construction. These planes are divided between the army and the navy.

The Norwegian Navy, with bases at Oslo, Bergen, Frondheim, and Karljohausvern, has 4 cruisers, of which one is a school ship, 3 destroyers, 28 torpedo boats, 8 patrol boats, 9 submarines, and 15 miscellaneous units. The total tonnage is 23,212 tons.

(5) LA PUISSANCE DE FEU DE LA DIVISION D'INFANTERIE NIPPONE AVANT ET APRES SA REORGANISATION. [The fire power of the Japanese infantry division.]

The Japanese infantry division now has 462 light machine guns instead of the former 230, and 153 heavy machine guns instead of 48. Battalions are organically provided with 37-mm. guns. The division artillery regiment now has 36 cannons of 75-mm., and 12 field howitzers, whereas it formerly had but 16 guns.

Thus the fire power of the division has been doubled. Moreover, it must be recalled that tanks are organically attached to certain divisions.

It can be said, therefore, that the Japanese Army is reorganizing at an accelerated rate.

(6) POUR LA SOUPLESSE D'ACTION DE L'ARTILLERIE. [Flexible artillery action.] General Challeat

In "La France Militaire," General Challeat comments upon the various types of matériel with which division artillery should be equipped in order to have its fire power flexible enough to meet the needs of modern battle.

He proposes for the division light artillery regiment: two groups of three batteries, each of six 75-mm. guns (7,500 yards) and one group of three batteries with six 75-mm.-47-mm. (4,300 yards) pieces.

Against normal battlefield obstacles he advocates 105-mm. howitzers (6,800 yards) and the longer-range 75-mm. gun (9,000 yards) for fire both at ground and aerial targets. Alongside the light artillery regiment, then, the heavy division regiment should include: two groups of three batteries of four 105-mm. howitzers, and one group of four long-range 75's.

Divisions also should be protected against low-flying planes by automatic 37-mm. cannons which would be grouped in a regiment by the army corps. Against tanks the division should be able to dispose of reserve units of 47-mm. guns and, if necessary, fall back on self-propelled antitank cannons.

(7) L'EMPLOI CONJUGUÉ DES CHARS DE COMBAT ET DES MOTOCYCLETTES DANS L'EXPLORATION. [The employment of tanks and motorcycles in reconnaissance in Poland.]

Motorcycle formations are merely extremely rapid and mobile infantry elements.

When the motorcycle unit is required to participate with the tank company in distant reconnaissance, the motorcycles move by bounds ahead of the tanks, insuring security to the front and flanks of the motorized force up to the making of contact, and reducing weak enemy resistance by their own means of fire. Supported by the tank company, they go forward as rapidly as possible to observe and get information.

After gaining contact, the mission of motorcycle units is closely linked to that of the tank company. The latter moves rapidly forward to attack the hostile advance guard and to feel out the strength and disposition of the main body.

After the tank success, the motorcycles occupy new observation points. Having reconnoitered the enemy dispositions, the motorcycles and tanks must maintain contact, regardless of whether the enemy occupies a defensive position or withdraws to fight a delaying action.

In a war of movement, the principal mission of motorcycle groups is to give the main body the time and space necessary to take up its combat disposition.

In defense, motorcycles may be sent to the front either to cover the flanks or to be used as a reserve for counterattacks or combat. In case of a retreat, the tank company and motorcycles mutually protect each other. In most cases, the motorcycle units can carry out the mission of fighting the delaying action.

(8) AUTRICHE: LA DIVISION MOTORISÉE. [Austria: The motorized division.]

The recent reorganization of the Austrian Army provides for the creation of a motorized division. This division has four battalions of motorized light infantry, two cavalry regiments, a battalion of tanks, and artillery and engineers.

The light infantry battalion comprises a headquarters company (47-mm. infantry cannons and 80-mm. minenwerfers), two rifle companies, and one of machine guns. Each motor vehicle comprises a combat group or its equivalent (engineers, machine gun, or minenwerfer).

The tank battalion has light machines like the Italian "Ansaldo 1933" (25 miles per hour, one machine gun), and heavy machines (antitank gun, light and heavy machine gun).

The division also has light tractors for machine guns which are 6½ feet long, 3¼ feet high, and equipped to run either on wheels or tracks.

August 1936

(9) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918.—LA DÉFENSE DU FORT DE FLÉRON EN AOUT 1914. [History of the Belgian Army in the World War: Defense of Fort Fléron in August 1914.] Lieut. General Mozin

Defense of the fort lying between the German frontier and the fortifications of Liege proper, 4-14 August 1914, against which the 12-inch German mortars were used.

(10) LES OPÉRATIONS MILITAIRES À LA FRONTIÈRE EST DE LA PROVINCE ORIENTALE PENDANT LA CAMPAGNE 1914-1918. [Military operations in Belgian East Africa, 1914-1918.] (IV) Lieutenant Bayot

Continuation of Belgian operations in East African campaign.

(11) LE PROBLÈME DE LA DIRECTION DE LA GUERRE DANS LES COALITIONS. [Conduct of war in coalitions.] (I) Lieut. Colonel Dendal

First of a series of articles on this subject which is of such great importance to all European statesmen and military personnel.

(12) DÉFENSE NATIONALE ET COMMANDEMENT UNIQUE. [National defense and unified command of the army, navy and air force.] Marshal Pétain

(13) L'ARME MÉCANIQUE DEVIENDRA-T-ELLE LA REINE DES BATAILLES? [Will the mechanized weapon become the queen of battles?]

In the 28 March 1936 issue of "L'Illustration," an anonymous author epitomizes the opinions of several powers on the tactical employment of mechanized arms:

The Russians seem to think of the tank as the jack-of-all-trades; they would use it, in case of war, both independently and in cooperation with other arms, and in almost all situations.

The Italians consider the tank essentially an auxiliary or support weapon. They do not seem to contemplate its use in mass.

The British, on the contrary, hold that the armored fighting vehicle is a new weapon which has many characteristic possibilities and which may accomplish missions suited to these characteristics.

The Germans view the tank as the arm of the offensive and foresee its use in heavy masses destined to strike a decisive blow. They also intend to use it in cooperation with other arms on current operations.

Lastly, the French visualize two roles for the tank and combat car: first, as the support weapon of infantry; second, as a mobile mass of fire power available during concentration, or to put into the service of an army in movement.

The British envisage the constitution of mobile, maneuverable divisions, composed of tanks of little weight. The Germans, on the contrary, look upon the tank division as a large unit of well-protected heavy vehicles.

Italians, French, and Russians expect to use a battalion of tanks to support a division, but they also organize and experiment with light motorized divisions.

The author wonders if it would not be advisable to create a sixth arm: the mechanized arm.

He also draws attention to the dangers which the increasing development of antitank weapons cause armored vehicles, and to the grave problems of supply that an intensive use of these machines would bring about in case of war. As an example he mentions that in less than two days during the maneuvers in Champagne (1935) two motorized infantry divisions and a light motorized division consumed 31,700 gallons of gasoline.

(14) LE RAVITAILLEMENT PAR AVION. [Supply by airplane.] General Rouquerol

From the Italian campaign in Ethiopia General Rouquerol draws interesting conclusions on supply by air which he discusses in the 21 May 1936 issue of "La France Militaire."

Besides giving many examples of the reconnaissance, bombardment, and liaison missions of aviation, the war in Ethiopia showed the possibilities of supplying large units in a war of movement entirely by air.

At the beginning of the campaign the Italians regulated their advance on the progress of road building. Beyond the ends of the vehicular roads, transport was by pack animals. It was only by chance that aviation supplied small amounts of food and ammunition, principally for one of the columns marching on Makalle in November and, in January, for the divisions moving to the battle of Tembien across a region particularly impracticable for vehicles.

The method worked so well that the system soon became general. After March, the troops en route regularly requested the supplies needed by radio, and within a few hours planes made the deliveries.

(15) ALLEMAGNE: OPINIONS ALLEMANDES SUR LA DÉFENSE ANTICARS. [German opinions on antitank defense.] Lieut. Colonel Nehring

In an article in "Militär Wissenschaftliche Rundschau," March 1936, the author advocates the following antitank organizations:

(a) Infantry company: One 20-mm. machine gun and one 20-mm. automatic rifle in each platoon, to be horse drawn and also movable by man power; on motorcycles in motorized units.

(b) Infantry battalion, cavalry regiment, artillery units: One platoon of four antitank cannons (horse drawn or motorized).

(c) Infantry regiment: A company of three platoons of antitank cannons (on cross-country vehicles).

(d) Infantry division: An antitank unit consisting of two companies like the regimental companies, an engineer company (obstacles, demolitions, mines), and a company of antitank machine guns (half light and half heavy guns).

(e) Army corps: An antitank battalion of three companies and a company of motorized engineers.

(f) Army: An antitank regiment comprising: staff, communication platoon, fast armored company, two antitank units, motorcycle battalion (cannon or machine gun), engineer battalion with obstacle material.

September 1936

(16) PAGES D'HISTOIRE DE L'ARMÉE BELGE AU COURS DE LA GUERRE 1914-1918: LE 1ER RÉGIMENT DE GRENADIERS À LA BATAILLE OFFENSIVE DE 1918. [History of the Belgian Army in the World War: The 1st Grenadiers (Belgian) in the offensive of 1918.] Lieutenant General de Callatay
Account accompanied by three good maps.

(17) LES OPÉRATIONS MILITAIRES À LA FRONTIÈRE EST DE LA PROVINCE ORIENTALE PENDANT LA CAMPAGNE 1914-1918. [Military operations in Belgian East Africa, 1914-1918.] (V) Lieutenant Bayot

(18) LE PROBLÈME DE LA DIRECTION DE LA GUERRE DANS LES COALITIONS. [Conduct of war in coalitions.] (II) Lieut.Colonel Dendal

(19) L'ORGANISATION DE L'ARMÉE ÉGYPTIENNE. [The organization of the Egyptian Army.]

The Egyptian army consists of the army proper, the military frontier forces, and the coast guards.

The army proper is recruited among Egyptians, Beoudouins, and Sudanese living in Egypt. The age limit is 18 to 25 and the duration of service five years active and five reserve. During recent years about 500 officers and 12,000 men have constituted the effectives. An increase of 5,000 has been prescribed and money appropriated therefor.

There are 3 infantry brigades having a total strength of 11 battalions, 2 cavalry squadrons, 4 artillery batteries, 1 garrison artillery company, 1 mechanized machine-gun battery, 1 engineer company. In addition, quartermaster, transport, and medical services are maintained. The air service is in course of formation, several planes already being in service. These forces are commanded by the Sirdar of the Egyptian Army.

The frontier force is composed of 10 camel platoons, 4 patrol groups with light automobiles, and an instruction section at Khanka.

The coast guards of about 90 officers and 3,000 men serve either on land or sea, operating on the patrol boats that constitute the Egyptian navy. Their principal or only mission is to contend with contraband runners.

The British force in Egypt is about 10,000 strong. The components of this force are 6 batteries of artillery, 6 battalions of infantry, a mixed tank battalion of 22 light and 19 medium tanks, and services—engineers, radio, signal, etc. Moreover, the air service is highly important. It maintains 4 squadrons of transport, bombardment, and observation, each containing 12 planes.

(20) LA GUERRE EN MONTAGNE. [Mountain warfare.] Lieut.Colonel Baron

Colonel Baron, writing in "La France Militaire" on the danger of German attack by way of Switzerland, reviews the German doctrine of mountain warfare:

Advance on a wide front over several roads.

Turning of narrow positions in order to strike communications.

Breakthrough of wide fronts and rapid exploitation.

In a breakthrough, rapid capture of heights to gain observation, especially for artillery.

Specialization of different kinds of artillery; howitzers for preparatory fires, flat trajectory guns for counterbattery and bombardment of routes of access, light batteries and mountain artillery for close infantry support, acting by section or single guns if necessary.

Breakthroughs designed to master the valleys as well as to gain the heights.

All actions must be closely coordinated.

Keypoints are attacked in order to make the intervening terrain fall.

(21) LES MINENWERFERS MODERNES. [Modern minenwerfers.] Colonel Blummer

In the "Artilleristische Rundschau" of June 1936, the author reviews the modern infantry cannons of various armies.

The Spanish army uses the 50-mm. "Valero-Ecia" mortar both with infantry and cavalry. It weighs but 15 pounds. From 15 to 20 rounds per minute can be fired. The projectile weighs 1.65 pounds. The range is 1,100 yards. This mortar is used by companies and troops. The 81-mm. "Ecía" fires a 2.64 pound projectile 800 yards. It is used by battalions.

A while ago the "Brandt" company brought out a company mortar of 60-mm. which weighs 39½ pounds. Four different charges give it a range of over 1,800 yards with a 2½ pound projectile and of over 1,500 with a 3½ pound projectile.

Since 1934, Great Britain has used a 76-mm. Stokes-Brandt mortar weighing 120 pounds and is broken into three parts of 40 pounds each.

The range varies from 120 to 1,500 yards. It is intended that the new machine-gun battalions of infantry regiments be provided with minenwerfers* and antitank cannons transported on Carden-Loyd vehicles.

The new Italian mortar, the 81-mm. Stokes-Brandt, performed well in Ethiopia. It breaks into three loads for carrying, total weight 132 pounds. The projectile weighs $7\frac{1}{4}$ pounds and has a range of 500 to 3,900 yards. Each infantry division has one company of these guns but a battalion is contemplated.

In France, the Stokes-Brandt 81-mm. mortar is mounted on a small tank. Since 1934 the army has also had 105-mm., 120-mm., and 150-mm. mortars.

But the most modern mortar is certainly the "Flugel Minenwerfer L/15" of 81-mm., constructed by the Rheinmetall-Borsig of Dusseldorf, which, as its name indicates, fires an 8.8-pound bomb with fins. The weapon weighs 187 pounds, is demountable and carried by three men. Its muzzle velocity is 840 feet per second; its maximum range, 4,800 yards; minimum range, 100 yards.

(22) JAPON: MODERNISATION DU MATÉRIEL ET MOTORISATION. [Modernization and motorization of the Japanese Army.]

Japan is proceeding methodically with the reorganization and modernization of her armed forces. New tanks and combat cars have been adopted.

Each division of infantry will have one motorized regiment containing four or five companies, a light artillery battery, a company of light tanks, a company of armored cars, and signal troops.

An additional project is under way to create a motorized brigade known as a "shock brigade" which will consist of three or four battalions of light and heavy tanks, of artillery, engineers, signal and quartermaster troops, all units entirely motorized.

CANADIAN DEFENCE QUARTERLY (Canada)

January 1937

- (1) POST-WAR POLITICAL EVENTS AND TRENDS. By "Periscope"
- (2) SLAV V. TEUTON. By Observer
- (3) CANVAS MODEL OR SAND TABLE DEMONSTRATION
- (4) "TIME, SPACE AND THE LEAGUE." Lieut.Colonel Baird Smith
- (5) NOTES ON THE TRAINING OF THE VOLUNTEER INFANTRY MILITIAMEN.
Captain Chesley
- (6) BORDER INCIDENTS NEAR THE BOUNDARY OF MANCHOUKUO.
Colonel Nikolaieff
- (7) THE CLASH IN PALESTINE. Prince
- (8) THE REPAIRS, RECOVERY AND REPLENISHMENT OF MECHANICAL
VEHICLES IN THE FIELD

CAVALRY JOURNAL

November-December 1936

- (1) MECHANIZED CAVALRY IN THE SECOND ARMY MANEUVERS, 1936.
Colonel Palmer
- (2) A COMMAND CAR FOR A CAVALRY REGIMENT. Captains Stodter and
Land
- (3) HAS THE ARMY TOO MUCH RADIO? Major General Allison
- (4) AN AUTOMATIC WATERING SYSTEM. Major Pickett
- (5) MILITARY CHARACTERISTICS OF COMBAT VEHICLES. Major Grow
- (6) THE DUKE OF WELLINGTON. Major General Fuller, British Army
- (7) DEVELOPMENT OF CAVALRY WEAPONS, PAST, PRESENT, AND FUTURE.
Lieut.Colonel Bradford

*REVIEWER'S NOTE: The new British infantry rifle battalions is to have four mortars in its headquarters company.

CHEMICAL WARFARE BULLETIN

October 1936

- (1) CHEMICALS AND AIRCRAFT. Brigadier General Brett
- (2) CAN METHODS OF WARFARE BE RESTRICTED? Major General Thuillier, British Army
- (3) ACTIVE DUTY TRAINING, 1936
- (4) THE GAS ATTACK AT YPRES. SOME FIRST-HAND TESTIMONY

January 1937

- (5) GAS IN THE ITALO-ABYSSINIAN CAMPAIGN. Major Murphy
- (6) CHEMICAL OPERATIONS IN THE SECOND ARMY MANEUVERS. Major Kubach
- (7) FIRST AID TO GAS CASUALTIES. Captain Keller
- (8) CHEMICAL WARFARE ORGANIZATION: FRANCE

COAST ARTILLERY JOURNAL

November-December 1936

- (1) THE WILL OF THE LEADER. Part I. Major Tindall
- (2) FORTY YEARS WITH THE ARTILLERY. Major General A.H. Sunderland, Chief of Coast Artillery, inspects past and present, and peers into tomorrow.
- (3) THE DUKE OF WELLINGTON. Major General Fuller
- (4) HAS THE ARMY TOO MUCH RADIO? Major General Allison
- (5) A CIRCULAR SLIDE RULE FOR SOLVING TRIANGLES. Captain Crichlow
- (6) A TARGET FOR AXIAL SPOTTING
- (7) LOADING COILS AND REPEATING COILS. Major Englehart
- (8) DETERMINATION OF LOCAL HOUR ANGLE OF A CELESTIAL BODY. Major Hickey, Jr.
- (9) WINTER CONVOY. Captain Young, and Lieutenant MacLachlan
- (10) THE ARMY OF THE UNITED STATES FROM 1830 TO 1840. Colonel Thomson
- (11) THE LEGION OF THE LOST. By Invictus
- (12) THE COAST ARTILLERY CUP AND THE NATIONAL MATCHES. Captain Engelhart

FIELD ARTILLERY JOURNAL

November-December 1936

- (1) ONE-SECOND FLIGHTS. Captain Kitts
- (2) CONVOYS AT THE CROSSROADS. Sergeant Dorsey
- (3) OVER HILL, OVER DALE, OVER AIRWAVE. Captain Gannon
- (4) THE NINETEENTH GOES TO THE CAMPUS
- (5) THE WINDS THAT BLOW. Colonel Keller
- (6) DUST FOR SIMULATED BURSTS. Sergeant Hooker
- (7) HAS THE ARMY TOO MUCH RADIO? Major General Allison

FIGHTING FORCES (Great Britain)

December 1936

- (1) LLOYD GEORGE AMONG THE GENERALS. By "Basilisk"
- (2) CO-OPERATION. By the Editor
- (3) WAR IN THE AIR
- (4) THE UNFOUGHT WATERLOO. Lieut.-Colonel Burne
- (5) THE BATTLE OF TELISSU

INFANTRY JOURNAL

November-December 1936

- (1) THE WILL OF THE LEADER. Part I. Major Tindall
- (2) CONTACT IS ASSIMILATED. By Tinsel Bars
- (3) THE DUKE OF WELLINGTON. Major General Fuller

- (4) SHOCK TROOPS, 1938. Captain Triplet
- (5) THE LEGION OF THE LOST. By Invictus
- (6) PUT A PUNCH INTO NIGHT ATTACKS. Major Skinner
- (7) HAS THE ARMY TOO MUCH RADIO? Major General Allison
- (8) THE MEDICAL FRONT. Major General Croft
- (9) TWENTY JOMINIS ARE WRONG. By Dissenter
- (10) FITUM. Cary
- (11) COMBAT RATIONS. Captain Bartz
- (12) YOU CAN'T WIN. Major Cooke
- (13) SOMEONE MUST KNOW. Lieut.Colonel Wadsworth
- (14) THIS SHOOTING GAME. By Neckout
- (15) WHAT OF THE R.O.T.C.? Benedict
- (16) THE NATIONAL MATCHES. Major McCullough

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS

(Great Britain)

November 1936

- (1) THE TRAINING OF PERSONNEL IN FIELD AMBULANCE DUTIES. Lieut.-Colonel Winter
- (2) WAR EXPERIENCES OF A TERRITORIAL MEDICAL OFFICER. Major-General Luce

December 1936

- (3) WHAT MEDICINE OWES TO WAR AND WAR OWES TO MEDICINE. Major-General Downes
- (4) WAR EXPERIENCES OF A TERRITORIAL MEDICAL OFFICER. Major-General Luce

January 1937

- (5) CONTRIBUTION TO DISCUSSION ON ANXIETY NEUROSIS IN THE ARMY. Major Lipscomb
- (6) WAR NEUROSIS. Dr. Mapother
- (7) WAR EXPERIENCES OF A TERRITORIAL MEDICAL OFFICER. Major-General Luce

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

January 1937

- (1) THE DEVELOPMENT OF TOTALITARIAN WARFARE. Major General Fuller
- (2) TRAINING FOR HIGHER COMMAND. By "Cincinnatus"
- (3) SOME ASPECTS OF MECHANIZATION AFFECTING THE R.A. Lieut. Colonel Thurburn
- (4) THE REAL PRINCE EUGENE. Lieut.General MacMunn
- (5) REFLECTIONS AND RECOLLECTIONS. FRANCE 1916. By an Artillery Brigade Commander
- (6) BALKAN SCENE. By "W.L."

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION

(Great Britain)

November 1936

- (1) The search for security against war. Steed
- (2) THE NEED FOR A MINISTRY OF SUPPLY. Wing Commander Williamson
- (3) SOME STRATEGICAL THEORIES OF CAPTAIN LIDDELL HART. Colonel Beadon
- (4) THE FLEET FLAGSHIP: A PROBLEM OF NAVAL COMMAND. Part II. Lieutenant Bennett
- (5) FLYING OPERATIONS IN HUDSON STRAIT. Flight Lieutenant Car-Harris
- (6) THE GERMAN ARMY MANOEUVRES, 1936. Lieutenant-Colonel de Watteville (See abstract, page 52)

Periodical Articles—Catalog

- (7) THE YOUNG GERMAN: HIS ORGANIZATIONS AND TRAINING. Lieutenant Cooke
- (8) AIRCRAFT VERSUS WARSHIPS: A SUMMING UP. Brevet-Major Mirehouse
- (9) SERVICE PROBLEMS IN PALESTINE. From a Correspondent in Jerusalem
- (10) MILITARY CONTROL OF A DISTURBED AREA. Captain des Graz
- (11) THE NEGLECT OF SEA POWER. Baxter
- (12) THE SPANISH CIVIL WAR

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION OF INDIA (Great Britain—India)
October 1936

- (1) SHOOTING FOR BURIALS—NOT BULL'S EYES. Major Bower
- (2) TWO FURTHER LECTURES ON THE MESOPOTAMIA CAMPAIGN—4TH OCTOBER 1915 TO 11TH MARCH 1917. Lieut.-Colonel Shearer
- (3) CHINA AND THE FOREIGNER. A REVIEW OF THE REASONS FOR ANTI-FOREIGN FEELING. Major Swann

MARINE CORPS GAZETTE
November 1936

- (1) SELECTION AND TRAINING OF RECRUITS. First Lieutenant Greene
- (2) THE UNITED STATES MARINE CORPS. Major General Lejeune, Retired
- (3) THE EARLY YEARS OF THE MARINE CORPS. Lieut. Colonel Metcalf
- (4) MARINES IN SAN FRANCISCO EARTHQUAKE AND FIRE
- (5) MARINE CORPS UNIFORMS, MEXICAN WAR PERIOD. Jenkins
- (6) THE COCO PATROL. OPERATIONS OF A MARINE PATROL ALONG THE COCO RIVER IN NICARAGUA. Captain Edson
- (7) PUBLIC RELATIONS. Millen
- (8) SEAPOW—WHAT IS IT? NAVY, MERCHANT MARINE, BASES. Captain Knox
- (9) AN INTRODUCTION TO THE STUDY OF AMPHIBIOUS WARFARE. Lieut. Colonel Whaley

MILITARWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

By Major F. Düring, Infantry
July 1936

- (1) TEGETTHOFF. EIN BEITRAG ZUR ANALYSE DES ERFOLGES. [Tegetthoff: An essay on the analysis of success.]

This article is an account of the career of Admiral Tegetthoff, who commanded the Austrian fleet at the battle of Lissa in 1866, when it defeated an Italian fleet of superior number and armament.

- (2) LIMANOWA-LAPANÓW 1914-1936. I. DIE KRIEGSHANDLUNG IM SPÄTHERBST 1914. [Limanowa-Lapanow, 1914-1936. I.—The conduct of the war in the late autumn of 1914.] Major General v. Steinitz

General v. Steinitz recounts the battle of Limanowa-Lapanow, which was fought early in December 1914, between the Austrian Fourth Army and the Russian Third Army. The battle at Cracow had been raging since 16 November, during which time a gap of about 65 miles had been formed between the Austrian Fourth and Third Armies. It was in order to prevent the Russians from breaking through this gap that the battle of Limanowa was fought, which resulted in a great Austrian victory.

- (3) NEUE GESCHUTZE. [New weapons.] Major General Rieder

The author describes in this article the 37-mm. antitank gun and the 150-mm. howitzer. He considers the adoption of a forked trail for the 150-mm. howitzer of debatable value.

August 1936

(4) DIE EROBERUNG VON OFEN 1686. [The capture of Ofen (Buda) in 1686.] Colonel Kiszling

An account of the siege and capture of Buda, which was occupied by the Turks, by the Allied armies under Duke Charles V of Lorraine.

(5) LIMANOWA-LAPANÓW 1914 UND 1936. II.—LIMANOWA-LAPANÓW 1936. [Limanowa-Lapanow, 1914-1936. II.—Limanow-Lapanow 1936.] General v.Eimannsberger

The concluding installment of this article speculates as to what would have happened in the battle of Limanowa if both armies engaged had been fully mechanized and motorized. General v.Eimannsberger believes that the fundamental principles of strategy and tactics remain the same but that the views of strength and time and space factors are changed.

(6) DIE OFFENSIVE FEUERKRAFT DER INFANTERIE. [The offensive fire power of infantry.] Major Daniker

The author asks for the return of the former offensive power of infantry by giving it weapons that will enhance its mobility.

(7) FLUGZEUG UND SPIONAGE. [Airplanes and espionage.] Field Marshal v.Urbanski

Stress is laid in this article on the importance of propaganda and espionage by means of aircraft and on the value of reconnaissance by aircraft to prevent sabotage by the enemy's air force.

September 1936

(8) VOR ZWANZIG JAHREN: DER KRIEG GEGEN SERBIEN 1914/15. [Twenty years ago: The war against Serbia, 1914-1915.] Colonel v.Wittich, Retired

The concluding installment of the operations of the Austro-Hungarian Army under Field Marshal Potiorek against Serbia in 1914-1915.

(9) DER FRANZÖSISCHE OPERATIONSPLAN AUF DEM BALKAN IM HERBST 1918. [The French plan of operations in the Balkans in the autumn of 1918.] Lieutenant Diakow, Retired

An account of the Allied plan of operations against the Bulgarians in 1918.

(10) GEDANKEN ÜBER DEN WERT, DIE DAUER UND DIE LEITUNG GRÖßERER TELEGRAPHENÜBUNGEN. [Views on the value, duration and execution of telegraph exercises on a large scale.] Lieut.Colonel Werner

(11) KRIEGSKOSTEN EINST UND JETZT. [The cost of warfare in former times and at present.] Prof. Meier

MILITAR-WOCHENBLATT (Germany)

By Major E.F. Koenig, Infantry

18 August 1936

(1) DIE WIEDERBEFESTIGUNG DER DARDANELLEN UND DIE MEERENGENFRAGE. [The refortification of the Dardanelles and the question of the Straits.] Rear Admiral Meurer

(2) GAB ES 1916 NUR DEN IRRWEG NACH VERDUN? (X. BAND DES WELTKRIEGSWERKES ÜBER DAS KRIEGSJAHR 1916.) [Was the offensive against Verdun in 1916 the only possible solution? (Vol. X of the German Official History of the World War, 1916.)] (III) General v.Wetzell

This is the third of a series of articles written by Ludendorff's great strategist and brilliant staff officer, upon the occasion of publication of Volume X of the German Official History. In this article he analyses further the leadership of General von Falkenhayn. He calls him a "political strategist," and states that Falkenhayn argued something like this: "England is the ultimate block to peace. If Germany will deprive it of its strongest prop, it will be the quickest way to end the war. France is the sword of England—therefore we must strike France at its strongest point, in order to completely break her support. Consequently an offensive against Verdun is the only answer."

General Wetzell seems to think otherwise. He states that the Germans were always most successful, and their successes more decisive, when they operated in conjunction with their ally—Austria. Of course, due allowances had to be made as to the capabilities and limitations of the Austrian army, but in general, when these two countries organized a coordinated joint attack, the results were always most satisfactory and quite decisive. Wetzell thinks that the enemy should have been struck where he was weakest. There were two weak spots. One was Russia. Ludendorff, then in the east, recommended a joint attack on Russia and the capture of all the Baltic lands, but the objection to that was that it required the entire general headquarters reserve of 20 to 25 divisions now on the Western Front. This front was not beyond a crisis. The new "Kitchener" divisions were beginning to arrive, and military England was becoming a factor. It was time consuming to transport all these men to the east, and it would be impossible to shift them back in time in case a crisis should arise on the Western Front. The third suggestion was made by Conrad, who wanted to attack Italy, as the weakest of the Allies. Falkenhayn had always figured that Italy was only a drag to the Allies, and that they would be glad to get rid of her. That he was wrong in this estimate is proven by the results of the 1917 blow against Italy, when all the Allies came to her rescue. Furthermore, the railroads to Brindisi were necessary to the allied operations in Salonika and Asia Minor. The Allies could not afford to have Italy be defeated. Another factor was the attitude of Rumania, which at that time was still on the auction block, for sale to the highest bidder. A defeat of Italy would have certainly kept Rumania from joining the Allies. Conrad had suggested that the offensive start through the Tyrol, especially as the Italians had placed the mass of their forces along the Isonzo. A success in the Tyrol would have driven the Italians onto the northern Italian plains, threatened the communications of the armies on the Isonzo, and interrupted the railroads to Brindisi. The objection to the plan was the fact that there were only two single track railroads to supply the troops participating in the attack.

General Wetzell does not deny that the ultimate decision would fall in France, but as he said, that blow should have been struck after the elimination of Italy. The results would have been decisive, and the demands by the Austrians for German troops were not excessive as all they wanted were from four to nine divisions, some heavy artillery, and some siege artillery. Therefore the objections applicable to a blow against the Russians were not valid here.

Furthermore, if Germany had granted the aid asked of them by Conrad in Tyrol they could have obtained, in exchange, unified command conditions on the Eastern Front, with Hindenburg-Ludendorff in command of all the German and Austrian forces. This action at that time would have saved the Luck crisis, and would have effected then what had to be done under the emergency after the Brussilov offensive.

The later success against Rumania as well as Italy, resulting from a joint offensive, proves that in 1916 a joint offensive from the Tyrol might have given decisive results, knocked away one of the great allied props, prevented Rumania from entering, and paved the way for a decisive victory in France.

By failing to cooperate with her ally, Germany made the biggest mistake of 1916. The unified operations of all allied forces towards a single objective is the most important of all the tasks of the higher leadership. This is a job not for the soldier alone, but for the statesman as well.

(3) DIE AUFKLÄRUNGSTROPPE. [The reconnaissance squadron.] Captain Gerhard

In view of the fact that the majority of the cavalry of several countries is destined to be used exclusively in reconnaissance units for divisions and corps, it is desirable to consider the question of their employment. Their work lays the foundation to the decision of the commander, and the success or failure of the operation.

Organization and command are all important. It became necessary to break with all cavalry traditions and to get away from the purely horse idea. A unit capable of meeting all contingencies had to be developed.

One problem is whether to use bicycles or motorcycles. Bicyclists are more quickly ready for battle, are noiseless, inconspicuous, require no gasoline, and are very mobile.

The necessity for heavy machine guns carried on trucks is generally acknowledged.

The communications equipment seems satisfactory, but the radio-telephone could be improved.

The problem of mortars, antitank weapons, and scout cars is unsolved.

As long as the mortar (Minenwerfer) is horse drawn it is just ballast, and has no place in a modern unit like the reconnaissance squadron. The present antitank guns are not adequate in their cross-country mobility, and not handy enough for a sudden meeting engagement with hostile tanks. The scout cars are armored too lightly, are open, are not mobile enough across country, and have no armor-piercing weapon, while its ability to travel backwards may be of value only in peace times.

A reconnaissance squadron must have high explosive, armor-piercing shell, must be armored and have vehicles competent to really reconnoiter.

Is it possible that a light tank (Christie type) might fulfill all three requirements?

They have good cross-country mobility. They can destroy road blocks with the cooperation of the infantry; they are not readily vulnerable to hostile antitank guns on account of their high mobility; they can protect the cavalry and the cyclists; they can attack hostile tanks and antitank guns; and they can remove quickly, without loss of time, such items as machine gun nests, which otherwise would seriously delay the squadron.

If it is to fulfill all requirements this vehicle should be armed with a cannon capable of firing both high explosive and armor-piercing shell. It is advantageous to have artillery while mortars are undesirable. Why not use vehicles with a cannon mounted on them? They represent the ideal cavalry cannon.

These tanks would be manned by a crew of three. The driver, the commander—who is also the observer—and the gunner. As a caliber a 50-mm. gun is suggested. Machine guns are not necessary, because the squadron has an ample supply of those already. The supply of gasoline is not a problem in a unit already motorized. Such tanks could be useful with the division as well, in protecting their advancing columns and as infantry cannon, but not for use in mass. In that case the growth and development of the antitank weapons would lead them to the same fate as the mounted cavalry charge.

The conduct of such a unit would be as follows: "To see without being seen" would be the ideal, but is not practicable in real war. On the contrary, fighting will be its daily routine; it will be discovered, chased, brought to bay, even though it did not seek battle. In spite of all that the squadron must advance as far as possible, something which it can only do if equipped with offensive weapons. Tanks will be a necessity, and the number of them required depends upon the mission of the reconnaissance squadron.

The squadron consisting of two types of mobility—horsemen and cyclists—exploits both types of organization, the one with high cross-country mobility, the latter with speed and quiet on roads, and therefore will not march as a rule in a single column. Their joint employment is the task of the leader. Short, concise orders, and an advance by bounds, carefully regulated, will be necessary. Two tanks will be necessary for each column in order to overcome minor resistance quickly and to reconnoiter. Two additional tanks will be necessary for security measures of the advancing column.

The cyclists are liable to come across road blocks at any time. The tanks can remove these with or without the assistance of the cyclists in a short time. The cavalry, riding cross-country in covered terrain will be spared the time-consuming task of hiding every time an armored car appears, or if fired upon, to disperse.

The nearer the enemy, the more unavoidable is combat, and the more the tanks have to take over the task of accompanying artillery. By quickly committing the tanks, minor resistance can be quickly overcome, and with the aid of heavy machine guns, even more determined opposition can be conquered.

Now as to reconnaissance itself. The reconnaissance squadron with its power for offensive action is the backbone of its patrols. The most valuable and quickest means of communication is radio. Distance plays no factor. But the most important reconnaissance agency and reporting agency is the mounted patrol and the mounted messenger, for it can go anywhere, and usually travel undiscovered. But its speed is limited and means lost time, and in war lost time means lost battles. Due to this fact, patrols more than 5 to 7 miles in front of the reconnaissance squadron, are not in a position to render timely reports, unless they are equipped with radio. Such patrols have the mission of finding the hostile main bodies behind the cavalry screen, and keeping them under observation, reporting constantly on the hostile movements by radio. Patrols limited to horses as messenger-bearing agencies are tied down to the squadron and must be used in "waves," based on the changing situation. If they are not constantly recalled, the strength of the reconnaissance squadron becomes weaker and weaker. This must be avoided. Time can be reduced by establishing advance message centers with motorcycle messengers available.

Such a reconnaissance squadron will be able to fulfill all requirements as a result of its offensive power, its mobility, and its capacity for rapid reporting, provided that it is reinforced by one or two troops of cavalry for the purpose of replacing casualties, so that the squadron is always at full strength.

Large cavalry units, organized along the same principles and reinforced by tanks and artillery, will give decisive results on all fronts, and in case the mechanized divisions fail to function, then they will become absolutely essential.

25 August 1936

(4) DES FELDHERN WUNSCHBILD. (X. BAND DES WELTKRIEGSWERKES ÜBER DAS KRIEGSJAHR 1916.) [Preconceived ideas affecting leadership. (Vol. X of the German Official History of the World War, 1916.)] (IV) General v. Wetzell

(See abstract, page 62)

(5) INFANTERIE UND PIONIERS IM KAMPF GEGEN PANZERWAGEN. [Infantry and engineers versus tanks.]

As antitank weapons will never be adequate to meet a modern tank attack, the author states that the infantry will have to do something about it as well, particularly when assisted by engineers. He states that during the attack little can be done, and that during retrograde movements there will be little time for construction of tank obstacles, but that during the defense, ample time and opportunity will be available.

Tank mines are very valuable, for they can be used in gaps not covered by fire. Some authors consider it the only antitank means in open warfare situations. But the author believes that they should be used only in areas that can not be covered by fire, which simplifies the problem of friendly tanks getting into them.

Engineers help by destroying bridges, creating floods, building blocks and barricades, driving piles, iron rails, etc., and locating hidden mines in these. The infantry, however, should do some of the work too, and certainly all of the minor installations should be constructed by the infantry.

Every infantry unit can protect itself adequately against tanks by means of its intrenching tools. Tank ditches can stop all but the largest tanks. Woods and villages can be rendered difficult for tanks. (Incidentally, it is not as easy as it sounds to fell large trees.)

But even if equipment and time do not permit the construction of effective road blocks, the infantry can construct "fake obstacles" out of high stacks, rock piles, fire wood, etc., which may not stop a mechanized vehicle, but will certainly delay it. These can be equipped with mines, so that the removal will await the arrival of engineers.

However, the principal task is to have a continuous tank obstacle in front of the main line of resistance. This may not run in a straight line, but will be adapted to the situation.

The author concludes with the statement that if the infantry learns to use its intrenching tools as antitank weapons, they will not feel too helpless with their machine guns and rifles, but will be able to face mechanized forces with a great deal of self-confidence.

4 September 1936

(6) VERDUN IN DER KRIEGSWISSENSCHAFTLICHEN KRITIK. [Verdun in military literature.] General Wetzell

Since Volume X of the German Official History has been published there have been a number of articles written on the decision of general headquarters to attack Verdun, but the author believes that some of them have gone too far. Many people forget the situation as known and as presented to general headquarters twenty years ago. For example, many authors claim that von Falkenhayn should have been guided in 1916 by the "Schlieffen doctrine of annihilation." That is bandying with words. In 1916 the relative strength of the opposing armies was such that there was little likelihood of an annihilation of either the French or the British armies, nor was there any genius present, who, on Falkenhayn's retirement, could have produced a decisive victory, or even promised one.

The suggestion made in Volume X that the German front in France should have been moved back, may have been applicable for 1915, but never for 1916. Even if this withdrawal had been executed during the winter 1915-1916 (but in reality this was impossible due to the situation in Serbia and Russia), it would have endangered the Germans enormously. The idea of a thrust from Metz was impracticable in view of the French fortresses. Post war criticism, if it is to be of any value, must always bear in mind the realities of war. General von Falkenhayn recognized the difficulties confronting him, but he saw no way of overcoming them. As the author has previously indicated, his only solution promising any chance of success lay in an offensive in the Tyrol.

Among the critics was an artillery officer, who complained that the postponement of the attack on Verdun, due to rainy weather, was "incomprehensible." Does this gentleman not realize that in 1916 observation was still essential for artillery fire? The present technique of firing was not developed until 1918. But the postponement of the attack was not entirely due to artillery considerations. The rain had made the terrain so difficult for the attacking infantry, that on their account, and principally on their account, the attack was postponed. And if such authors still believe that a surprise attack on Verdun at the outbreak of the war was "playfully simple," they are sadly mistaken. Such suggestions smack of the layman, and are simply impossible in practice.

Other critics state that by postponing the attack from 12 to 21 February, the chances for German success were diminished due to increase in the French garrisons, others that the attack should have been made on both banks of the Meuse, and still others that the failure to continue the submarine blockade led to the disaster. The author disagrees with all three of these comments. He states that the French general headquarters knew by 10 February of the German plans for the attack on Verdun, that they then placed large reserves at the disposal of the fortress, but that these reserves were all badly defeated on 21 February, when the attack actually took place. Had they attacked on the 12th they would have had to contend with the permanent fortifications, which could be held effectively by a skeleton garrison. As a matter of fact, the capture of Douaumont later was an incident and lucky chance, which probably could not have occurred earlier.

An attack on both banks of the Meuse was impracticable at the time, because the Germans lacked the forces for such an offensive. The general reserve amounted to only 25 divisions, and that was not enough for a grand scale attack on both banks of the Meuse. Neither the artillery, nor the infantry were adequate in number. Any German attack on the Western

Front in 1916 was bound to demand more forces than were available. Even the matter of reserves for the assault units became a problem, which had to take into consideration the situation at the other fronts. Later, in 1918, general headquarters had four times the number of reserves available, adequate artillery, and a plentiful supply of ammunition.

The submarine blockade question also has two sides. In the spring of 1916 General v. Falkenhayn and the Minister of War made inquiries at the Navy Department as to the possible effect of America's entry into the war. They were told that it would be negligible. Not only did the commander-in-chief have to figure on the presence of a possible million Americans in France by 1917, but America's entry into the war on the side of the Allies would have hastened the entry of Rumania, and would have strengthened the weakening Russia. It is to be noted that the Navy had estimated that England would be defeated within six months as a result of submarine warfare in 1916, but failed to notify the army the same year, when instead war with America became imminent. Taking the situation as a whole, the Chief of Staff may not have been so far off, in estimating the general situation, and making corresponding decisions.

In his memoirs Admiral von Tirpitz considers the breaking off of the submarine blockade as a mistake. He states that in view of Britain's lack of defense at that time, it had great promise of success. But both he as well as the rest of the navy were under the impression, fostered by General von Falkenhayn and the war minister, that the intervention of America on land would be negligible. Admiral v. Tirpitz also complains that a limitation in time placed upon him was unwise, due to unpredictable conditions. But, no matter whether right or wrong in theory, the fact remains that in 1918 the intervention of America on land was the decisive factor in the war. Success in war, after all, belongs to the "strongest battalions," provided they are properly employed.

(7) PIONIERE UND ARBEITERBATAILLONE IM ABESSINISCHEN FELDZUGE. [Engineers and labor battalions in the Ethiopian campaign.]

(8) WEGE UND IRRWEGE UM DIE PANZERABWEHR. [A discussion of antitank defense.]

This is an article written in a controversial manner in answer to a number of articles on antitank operations previously published in the "Militär-Wochenblatt." The following thoughts are expressed by the author:

(a) If the tank is to be employed in combatting the automatic weapons of the enemy, while the infantry is fighting well forward, it will be necessary for the tank to be in advance, so that it will attract the hostile grenade and machine-gun fire. Is this not in direct contradiction to the doctrine that tanks should not be employed against an organized position? Some say that tanks should be committed only against an organized defensive position, after it has been reduced to some extent in fighting strength, for example, after a portion of the hostile artillery has been silenced. But the idea of utilizing tanks in a special phase or zone of the battle violates all our principles of cooperation.

The breakthrough by a tank force through a prepared, organized hostile position is not in accord with the characteristics of that weapon. On the other hand, large tank organizations are the ideal means for penetrating through hostile resistance. The contradiction in these two statements is explainable if we consider that tank organizations lack the infantry and artillery to hold what they have captured. For that reason tank attacks must be coordinated with infantry and artillery, as an equal, and not as an auxiliary weapon.

The neutralization of the hostile machine guns and artillery, located in depth, can not be accomplished by the infantry weapons or the artillery. This is the best field of activity for the tanks. The former are limited by observation and range, while the latter can "underrun" the fire of these weapons, and place them out of action by direct fire.

The battle picture is often rather dim. Frequently the infantry will capture the front line organizations without other support in their first rush. The tanks, like the cavalry of old, may have to be kept in ambush,

ready to spring at the opportune moment. Later, when the advance has outstripped our observation, the tank will find its greatest utilization.

During the crisis of the battle it will, however, always be the duty of the tank to eliminate or neutralize the fire of the machine guns and artillery in the rearward areas. Here they will often have to outstrip their own infantry and fight in a zone all by themselves. In view of modern development in antitank defense this calls for their employment in mass. The rule will be: The employment of complete, independent tank units against designated objectives. But its use in small units, subordinated to the infantry as an auxiliary arm should but rarely be the case.

This conception of the employment of the tanks does not violate the principle that all combat means should be concentrated on the decisive point. For example, while the infantry is attacking a certain piece of high ground or hill, the artillery might be firing on other artillery, or machine guns, several thousand yards away, which are hindering the infantry by flanking fire. In the same way the tanks would be attacking units, which bring indirect fire to bear on that infantry. We must not interpret the principle of concentrating everything on the decisive point too literally. This should all be worked out in the firing plan for the attack, and those units expected to delay the infantry should be allotted for neutralization to the weapons best capable of handling them; some to the light artillery, some to the howitzers, others to the infantry themselves, and finally, some to the tanks. Tank enthusiasts think of the tank attacking alone. We know this to be suicidal, for modern antitank defense would ruin such an attack. The tank needs the support of adequate artillery to hold down the antitank weapons, and it needs infantry to hold the ground it has overrun. It is the same principle as has always been found true: Grenadiers—Cuirassiers—Cannoneers! The tank of today being the cavalry of yesterday.

(b) It has been stated in previous issues of the "Militär-Wochenblatt" that an infantry division alone could not withstand a determined tank attack. This is no more true nor applicable than any generality of that sort. A modern, well trained infantry division can of course resist a tank attack as well as it can an infantry or artillery attack. It did during the World War. Many German divisions resisted tank attacks during the war. But with what losses! We are not belittling our heroism when we demand that the infantry division will have to be supplied by responsible authorities with adequate antitank means. Higher commanders should have highly mobile units at their disposal to assist the divisions fighting in front.

(c) It has been suggested that the infantry adopt the present light machine gun (Madsen) on a tripod as its heavy gun, and equip the present machine-gun companies with the 20-mm. gun, as an all-around weapon against infantry, tanks, and aviation. The author disagrees, and states that all armies have found the necessity for specialized weapons against each type of target. He thinks that the German antitank gun has an adequate caliber against present tanks, and if properly camouflaged and held until the tanks arrive, will be useful, because its range is greater than that of the tank cannon.

(d) At present there appear to be two schools of thought about tanks. These are expressed in the following principles:

"The tank is the means by which the higher commander throws the weight of his attack at the decisive point. It is normally employed in masses, as an independent unit, coordinated with, and of equal value with the infantry and the artillery, and is never subdivided."

The contradictory principle, lately expressed in tank articles, is:

"The tank is normally an auxiliary arm of the infantry, split up into small units, attached, and employed on limited objectives, both in offense as well as defense."

Depending upon the interpretation of these principles, and the decision as to which of these is correct, the entire problem of tank defense is affected. It is not the author's purpose to determine this, but by presenting the contradictory features of the subject, to arouse discussion and thought.

(9) FEUERÜBERFÄLLE. [Surprise attack by infantry.]

The article gives concrete suggestions on means and methods of training infantry in "ambush tactics." The author states that "the seconds between the appearance of the attacker and the effectiveness of his fire are decisive in battle." Surprise is essential; it must be achieved by speed and accuracy, which can only be gained by practice.

(10) KLEINIGKEITEN? [Incidentals?]

An article discussing the fact that so-called incidentals in peace time training are the most important in war. In action, the author says, a battalion commander devotes a much larger portion of his orders to matters of administration and supply than to pure tactics. Peace time training should allow for that and not treat the matter as "incidental."

11 September 1936

(11) DAS SCHNELLE HANDELN DER ARTILLERIE IM BEWEGUNGSKRIEGE. [Quick action by artillery in a war of movement.] Lieut. General Marx

(12) DAS PROBLEM. [The problem of military training.] Major Köller
This article, of special interest to the German situation, contains, however, the following interesting paragraphs in conclusion which are worth noting:

The nation's youth should be prepared, without arms, for the later formalized military training, by developing their eye and appreciation of the terrain. Secondly small caliber shooting.

Reservists should be given an opportunity to keep abreast of new developments. Reserve officers should be given an opportunity to actually command.

The art of war is not a game of play. Formerly it was an art which was inbred and developed by training among its higher leaders. The common soldier had to know but simple things. But not so today. Every soldier wages war by himself with the aid of the most scientific refinements and machines available. He must be an artist as well as a technical scientist. And to develop such individuals takes time, much time, if one is to have an effective army.

(13) ÜBER DEN FLUGMELDEDIENST IM AUSLAND. [Antiaircraft intelligence service in foreign countries.] Colonel Nagel

Quoting the American, French, British and Russian doctrines, which are largely similar as to methods of warning of hostile air raids.

(14) DAS ZIEL DER GROSZEN MANÖVER ITALIENS. [The purpose of the recent Italian maneuvers.]

The author states these were threefold: Testing the new infantry organization and weapons; experimenting with motorized units in roadless terrain, based on the Ethiopian lesson; and the supply of water in arid country.

(15) GEDANKEN ÜBER DIE EINJÄHRIGE DIENSTZEIT. [One year military service.]

An article on German one-year compulsory service. Conclusion: Even if the entire scope of a private's duties can not be covered, one thing must be—the development of character.

(15) DIE VERTEIDIGUNG BELGIENS. [The defense of Belgium.] v. Borcke

18 September 1936

(16) AN EINER WENDE DER STÄNDIGEN BEFESTIGUNG ERLÄUTERT AN DEM BEISPIEL DER FESTUNGEN PRZEMYSL UND VERDUN. [Progress in the construction of fixed fortifications, as exemplified by Verdun and Przemyśl.] Major General Klingbeil

The fates of Verdun and Przemyśl in the World War were so radically different, that it is considered worth while to briefly consider the real differences between the two. Both fortresses were originally constructed in the past century, when fortresses were primarily intended for the purpose of assuring the possession of certain critical terrain features. The idea of coordinating these with the operations of the mobile army led to the inclusion of facilities for shelter for large mobile forces, the extension of the defensive works to include this area. Ultimately the forces provided for in the enlarged fortresses became so large that they were able to take care of themselves without the fortifications. The constantly increasing range of

the artillery on the other hand increased the distances to which fortifications had to be extended, which in turn called for a larger garrison and thus formed a vicious circle. The larger the fortress the greater the attraction it became to a beaten army.

With the turn of the century, however, a complete change of ideas took place. Instead of independent fortresses there was a general tendency to lean toward the strengthening of strategic terrain features so that they could be held by smaller forces, and so developed that their location fitted into the strategic plan. It was not believed that such fortifications would attract a beaten general, nor that they would be laid siege to by an enemy, unless a mobile force could thereby be attacked.

Przemysl belongs largely to the old fashioned form of fortification. It had never been expanded to modern proportions as a result of an idea of false economy in Austria. It did not even have any relation to the Austrian concentration plans, for it was located in rear of the concentration area, and was to be used only in case of a driving back of the Austrian armies by the Russians. This was actually the case early in 1914. During its investment by the Russians for three weeks it not only held itself, but its energetic garrison inflicted considerable casualties on the enemy. That Przemysl was not evacuated in 1914 is generally conceded to have been a mistake. In the first place there was little prospect of a prompt relief at that time; for another, its supplies had not been replenished to the point where it could be expected to withstand a lengthy siege. Then the decision to hold the fortress was based entirely upon political and not on military reasons.

Verdun on the other hand, could have been captured by a violent and sudden attack just as easily as were the other fortresses in Northern France in 1914, or even in 1915, but by 1916 the French had learned a great deal about fortifications, and had combined the use of terrain and artificial works of man to produce a highly efficient modern defensive fortification. In addition to that the delay in the original attack plan, due to the weather, enabled the French to make still greater preparations. Verdun was organized in depth in 1916. Up to then a rupture of the line of fortifications had led to the capture of the entire system. In Verdun the difficulties of the terrain as well as its organization in depth did not permit such a course of events.

The French were prepared to evacuate Verdun in 1914 and in 1915, and even early in 1916 they had planned on withdrawing to the west bank of the Meuse. It was due entirely to the activity of Briand and Castelnau that Joffre changed his plan of defense and added the statement, "Verdun will be defended on the east bank of the Meuse."

The fate of these two fortresses bears out the statement of Ludendorff's: "The day of the fixed fortress is over. It can meet the weight and volume of the artillery fire placed on it. Fortified terrain, on the other hand, will always remain necessary, but it will have the character of extended border defenses, rather than isolated localities."

(17) BETRACHTUNG ZU: "DIE ENGLISCHE KAVALLERIE 1918." [The British cavalry in 1918.] Count von Puckler-Burghausz

In 1935 a book entitled: "The British Cavalry in France in March and April, 1918," by Captain Zimmermann, was published. It covers a period when the effect of modern weapons was at its highest development, and touches a period when the German authorities were unwilling to risk their available and unused cavalry units on the Western Front.

The following lessons may be gathered from this book:

(a) The British cavalry executed its missions of closing gaps and bringing about decisions at critical points, during the period 21 March to 5 April 1918, in full.

(b) It was a mistake to use cavalry as infantry, away from its mounts (average distance, 15 miles). Its fire power (average 150 men per regiment) was inadequate. The lack of supply animals was seriously felt (machine gun ammunition).

(c) Mobile reserves were to be created. For this purpose horseholders were reduced to one for every ten horses (horses immobile).

(d) As the cavalry had been spared, and had a high percentage of regular officers and noncommissioned officers, its combat value was greater than that of the infantry.

(e) There were only two successful instances of a mounted attack: Villeselve on 24 March, and Moreuil on 30 March. It was only successful against poor infantry that had never learned (or forgotten how) to use the rifle, and was easily panic stricken.

(f) Horses could be held mobile only if that fact was not discovered by the enemy. Otherwise they were promptly shot up. (The quarry of Falvy on 23 March, when the horses of the 19th Hussars were discovered by an aviator.)

(g) The cavalry was dependent to a large extent upon bridges for river crossings. (On 23 March the 8th Hussars had to abandon their horses on the east bank of the Somme.)

(h) Close-in reconnaissance results were excellent.

(i) The cavalry reached positions under cover, and under defilade, which trucks could not have reached in time.

(j) The higher leadership of the British cavalry failed completely. Division and corps commanders were too far in rear to be able to exercise any influence on the progress of the battle.

The majority of the conclusions may be considered as purely advantageous to cavalry.

But why did the British cavalry do such excellent work in 1918, and fail so completely the year before? The difference is to be found in the organization of the enemy. In 1917 the Germans were organized in depth. In 1918 they were operating across terrain, through which neither artillery nor supplies could advance. The German units attacking were weak in strength, without artillery support and operating in strange terrain.

In other words, in known terrain, on the active defense the cavalry can accomplish a great deal—operating against hostile positions in the attack it can do no more than the infantry.

The well led British cavalry was useful as a mobile reserve in a defensive situation.

The author then states that all the functions of the cavalry have been taken over by mechanized forces. That the short distances they can march, the difficulties of supplying forage, the high proportion of horseholders, and difficulties of camouflage, all make the horse obsolete.

American readers will be interested to note that the editors of the "Militär-Wochenblatt" do not agree with the author, but have added footnotes which state that modern cavalry, advancing in thin waves can cross terrain, especially arroyos, water courses, swamps, etc., which are still impassable to mechanized vehicles, and that as far as camouflage is concerned they can disappear in woods or orchards much more effectively than trucks. Forage is carried on the animal and brought up with animal-drawn transport much more readily than the heavy gasoline tank trucks can operate, etc.

The author comes to the conclusion that cavalry as such is a thing of the past, and that the present cavalry units of the army will be subdivided among infantry divisions to act as reconnaissance agencies for them, but that mechanized units will replace the cavalry divisions and corps of old.

(18) PANZERJÄGER ODER PANZERKAMPFWAGEN? [Tank chasers or tanks?]

A further contribution to the general subject of antitank defense. The Germans have for some time been considering the creation of a special highly mobile weapon of great armor-piercing power, to be used analogous to pursuit aviation as a "tank chaser." The present article discusses the advantages and disadvantages of such a weapon as compared to the tank itself as an antitank weapon. The author concludes that for reasons of economy (there never being adequate funds for any army to do with as it wants), it would be far better to use the tank as the principal antitank weapon than to depend upon an additional corps or tank chasers. The tank has not only defensive capabilities, but offensive ones as well, and could always come in handy in supporting the infantry in local attacks or

counterattacks, whereas the tank chasers would be purely defensive weapons. The author feels that organic tank units are therefore essential.

(19) DIE SPIONAGE DER AMERIKANER IM WELTKRIEGE. [American espionage during the World War.]

(20) WEHRWIRTSCHAFTSLEHRE ALS WISSENSCHAFT. [War economics as a science.] Dr. Beyer

(21) SEGELFLUG—DIE GRUNDSCHULE DES FLIEGERS. [Soaring, the basic training of the aviator.] Captain Schreiber

(22) FEST EINGETHEILTE SPÄHTRUPPS. [Organic patrol units.] Brandt
Apparently there has been organized in many German infantry companies a permanent detail for reconnaissance and patrol duties. These men are specially trained as observers and give superior service in maneuvers and peace time training. The author thinks such an organization unwise and unsound, because in war they would probably not be available, and every infantryman should be trained for such duty, and what he did not practice in times of peace he would not know how to do in war.

25 September 1936

(23) DIE GROSZEN ITALIENISCHEN HEERESMANÖVER IN IRPINIA. [The Italian maneuvers in Irpinia.] Lieutenant Himpe

A detailed account of the strategic and tactical moves of both sides. No conclusions drawn. Mention is made of an engineer ladder truck, which similar to fire apparatus, pushes foot bridges across streams and cuts. Also exhibited was a new mountain foot bridge with a length of 60 feet and a capacity of 7,000 pounds.

(24) ZUR FRAGE DER ARTILLERIEFLIEGER. [Artillery and aviation.] Lieut. General Marx

The author states that there are two things about the World War "that he would prefer to forget": One is the German "Tonnage Calculation" (referring evidently to the Admiralty estimate of the effect of American participation); and the other, the failure of the German counterbattery service, especially at Verdun. This latter failure he ultimately traces to faulty artillery spotting service by the aviation.

General Marx then goes into a lengthy discussion for the necessity of an artillery staff officer at all higher headquarters. He states that a technical artillery is necessary in order that all new developments in field artillery technique should be promptly disseminated and coordinated. Finally, he concludes that this is particularly necessary to the execution of the counterbattery mission. For this purpose the artillery spotting plane is essential, and according to the author, should be an integral portion of the artillery organization.

He compares the relation of the aviation spotting service to the artillery with the relations of a medical officer on the staff of a commander. He feels that the aviator should live with the artillery officers, should be told when and what to do by the artillery commander, and should in turn receive his technical instructions, supply, and the detailed "how" to do his job from his aviation superiors. He says: "My surgeon would receive orders from the army surgeon to vaccinate the command, and how to go about it, but I issued the orders as to when the command would be vaccinated, and where." So the flier with the artillery would bear the same relation to the artillery battalion commander as any other staff officer. But he says that they must be specialists, expert in plotting artillery fires, of that particular unit to which assigned.

General Marx says: "The modern battery command post is in the airplane. The airplane is as much a vehicle of the battery as its rolling kitchen, and some day when aviation will come back to earth, artillerymen will be trained to groom the ship like any other battery vehicle."

(25) DIE AUSBILDUNG DER INFANTERIE IM PIONIERDIENST. [Engineer training for infantry.]

Engineer functions are always neglected in training infantry. This is primarily the case, according to the author, because it is such a large subject that no one knows exactly where to begin, or where to stop. He

offers, therefore, a few concrete suggestions of some of the things in which infantry should be trained:

The burning of wooden bridges (demonstration); Destruction of bridges (discussion); Construction of tank traps (actual spade work); Felling of trees (this is much harder than it seems, unless practiced); Construction of road blocks; Erection of barbed wire obstacles; Creation of fake road blocks; Removal of road blocks, barricades and wire (beware of explosives); Rowing of pontoons and rafts; Testing of bridges (necessary knowledge for every patrol).

The author states that most infantrymen are pretty well trained in the construction of field fortifications, but lack experience in the subjects mentioned above. A great deal of emphasis is being placed upon the proper removal of road blocks, which may have been constructed by our own engineers, without waiting for the arrival of technical experts. As these almost always contain explosives set off by trip wires, so planned as to injure the remover, a special technique in the removal of road blocks is necessary technical training for each infantryman.

(26) TANGER IM SPIEGEL DES SPANISCHEN BÜRGERKRIEGES. [The situation in Tangier during the Spanish Civil War.] Major Welsch

(27) DIE MILITÄRISCHE ZUSAMMENARBEIT ZWISCHEN DER TSCHESCHOSLOWAKEI UND RUSZLAND. [Military cooperation between Czechoslovakia and Russia.]

Russian liaison officers are at all higher headquarters at present. Russian officers alternated with Czechs in commanding the last air maneuvers. Reports indicate the construction of many airdromes with subterranean fuel storage along the Carpathians. The author believes that Rumania has given permission for the passage of Russian troops through their territory in case of war. Rumanian, Russian, and Czech railways and roads are being developed and built so as to permit a rapid concentration of Russian troops in Czechoslovakia. It will take another five or six years to complete all this construction, and will cost over a billion crowns.

4 October 1936

(28) STUDIE ÜBER OPERATIONSPLÄNE UND KRIEGSWIRKLICHKEIT. [A study of war plans and the realities of war.] (1) General Wetzell (See abstract, page 27)

(29) PANZERJÄGER! [Tank chasers.]

In German literature on mechanized combat, a new term, the "Tank Chaser," has recently appeared. This article clears up any misunderstandings American readers may have of such a weapon. In the first place it is a purely theoretical weapon—there is none in existence. Secondly, there is considerable doubt as to its necessity. Many experts believe that the tank against the tank is the solution. Others, however, reason that the normal tank armament is adequate merely against unarmored targets, and that a special armor-piercing cannon of great mobility is necessary. The specifications for the ideal "tank chaser" are therefore the following:

- (a) Armor-piercing armament, caliber 50-mm. Flat trajectory, quick firing, rapid aiming device. It must be able to penetrate the armor of the heaviest tanks at ranges beyond the latter's effectiveness.
- (b) Mobility greater than that of the tanks, which it must seek.
- (c) Cross-country ability is secondary as it will not have to go cross country, but merely move to points from which it can reach the tank.
- (d) Armor—merely adequate against machine-gun fire and shell fragments.

Such a weapon might also possibly be equipped for anti-aircraft missions. The author avoids the issue if such a weapon is technically feasible, or economically justified.

(30) AUSBILDUNGSGESICHTSPUNKTE FÜR FALLSCHIRMJÄGER. [The training of parachute jumpers.] Major Eggebrecht

This article is of particular interest because it indicates the great importance given to this subject in Europe. The "vertical envelopment" has entered tactics with a vengeance. The author states that the Russian army has 60,000 men trained and equipped for parachute operations, and a civilian reserve of 600,000. The following is a brief summary of the points made:

Physically the jumper should be light weight, free of dizziness and air sickness.

He must be courageous and clever; possess initiative.

Training begins by making men dive 30 to 50 feet into water. In Russia they then jump from towers. The author does not agree with that method, as the critical thing is to wait until the jumper's horizontal momentum has decreased, and that is not learned from tower jumps.

Next comes participation in airplane flights to give the prospective jumper the "feel of the air" and to determine that he is free of dizziness and airsickness. Then comes the actual jumping from moving ships, beginning with slow ships at great heights, later increasing the speed and bringing them closer to the ground. The practice (said by the author to be American) of being pulled off the lower wing is deprecated as failing to develop character and technique for mass descents.

Then comes training in mass descents. Practice in organizing ground groups, fire control, etc. It is suggested that organization commanders be equipped with specially colored parachutes, one color for company commanders, another for platoon, and still another for squad leaders. Specially colored parachutes for ammunition and food are also suggested. The landed force will have to be supplied by air, and that calls for superiority in the air in the sector concerned. Although originally offensive, vertical enveloping forces will sooner or later have to take up the defensive.

(31) *ERFAHRUNGEN BEI DER AUSBILDUNG VON INFANTERIEPIONIEREN.* [Experiences gained in training infantry in engineer duties.]

In common with all modern German writers the author specializes on the construction and removal of road blocks. Engineers will not be available at all points where such work is needed. The great German emphasis on these is worth noting. Also, such items as we take for granted, as the ability to row rafts, is practiced in Germany. The inference must be that it requires practice, and that the average infantryman does not know how to maneuver a simple raft on lake or river.

(32) *MANÖVER DES BELGISCHEN KAVALLERIEKORPS VOM 6. BIS 8. 7. 1936.* [The Belgian cavalry maneuvers in 1936.]

A detailed account of these maneuvers with the following conclusion: that motorized troops are superior to portee cavalry in the mission assigned (that of protecting the Belgian frontier).

(33) *ROHSTOFFTAKTIK.* [The strategy of raw materials.] Captain Ruprecht

A general discussion and classification of strategic raw materials without divulging any new facts. Identical with our conception of the subject.

(34) *WAFFENEINSATZ IN SOMMERLICH BEWACHSENEM GELÄNDE.* [The use of weapons in summer.]

A discussion of the effect upon weapons of summer vegetation, which increases the opportunities for cover and camouflage and decreases the observation and visibility of aim. A call for practicing the installations of outposts, machine-gun nests, etc., in difficult terrain.

11 October 1936

(35) *HEER UND OFFIZIERKORPS IM BILDE VON ZWEI DEUTSCHEN SCHICKSALSWEENDEN.* [The German army and its corps of officers in 1806 and in 1914.] Major Buhle

A comparative and paralleling account comparing the dark days after Jena with those after the World War.

(36) *STUDIE ÜBER OPERATIONSPLÄNE UND KRIEGSWIRKLICHKEIT.* [A study of war plans and the realities of war.] (II) General Wetzell (See abstract, page 27)

(37) WEHRWISSENSCHAFT UND WEHRPOLITISCHES DENKEN VOR 1914. [The art of war and politics in the light of military strategy prior to 1914.] Lieut. General Marx

A defense of Germany prior to the World War. Germany had done everything it could to be prepared then, according to the author. He also emphasizes that Germany was not defeated by propaganda, but physically. He cautions against the wholesale criticism of a generation, which today still commands, and points out the danger of creating a spirit of "Is it reasonable to obey such fossils?" Germany was "militaristic" before the war, and should consider this an accolade according to the author.

(38) GEBIRGSSOLDATEN. [Mountain troops.] Steffmann

These are the corps d'elite of any army. They are tougher, more resistant, more tenacious than other fighters as they operate under terrific difficulties. The machine gun and mountain artillery have particularly difficult tasks. Mountain warfare calls for special tactics, alternate positions, and mining operations. The attack in the mountains calls for the highest exertion, supply is difficult, but success, when it comes, is usually decisive.

(39) DER KAMPF IM HINHALTENDEN WIDERSTAND. [The delay in successive positions.]

The author states that this is frequently wrongly practiced in maneuvers and tactical exercises. The delay must mean a distinct stopping of the enemy's advance, and to offer resistance means to fight. The withdrawal only begins each time after the enemy has been repulsed. In maneuvers the units usually withdraw too soon. The reasons for that the author finds primarily in lack of appreciation of the defensive power of modern weapons. This can be corrected by proper indoctrination of umpires.

Normally the real difficulties of the attack begin only when it has reached the zone of action of the light machine gun. The enemy must be allowed to come much closer than is normally the case in peace time exercises.

The time of withdrawal can most probably be ordered by the commander, but only after the hostile attack has begun. Orders will have to be transmitted quickly and by a prearranged method.

The commander will also frequently have the opportunity to change to a defensive attitude when he realizes that he is holding favorable terrain, and the hostile attack is getting into difficulties. On the other hand, a withdrawal from a position organized in depth will always be difficult in daylight. For that reason, delaying positions should normally be fought along what would be a main line of resistance in case the decision is made to hold.

The main principle is to take every advantage of favorable terrain and utilize in full the defensive power of modern weapons. It is essential that the enemy be left in the dark as to whether a determined resistance is going to be offered, or whether he is merely being delayed.

(40) DIE MILITÄRPOLITISCHE AUFRÜSTUNG IM ENGLISCHEN EMPIRE. [The strategic situation of the British Empire.]

A discussion of the British policy in the Mediterranean, the importance of the Bahrein Islands, and of the growing weight placed upon the South African route. Singapore as the corner stone of the British in Asia is mentioned. The present policy seems to be directed against Japan. The author states: "It is not impossible that Great Britain will some day take over the Philippines as an outpost against Japanese expansion."

(41) DIE FRANZÖSISCHE WEHRMACHTAKADEMIE. [The French College of National Defense.] Colonel Xylander

The purpose of this new educational institution is to coordinate industrial, financial, educational, colonial and labor policies towards a unified system of national defense, based on a well thought out strategy. The land, air, and naval arms are to be coordinated, and the army officer is to be initiated in the strange realm of strategy and the conduct of war. The article quotes French comments, not all of them sound or constructive.

(42) DIE EISENBAHNVERBINDUNGEN ZWISCHEN RUSZLAND UND TSCHESCHOSLOWAKEI. [Railroad connection between Soviet Russia and Czechoslovakia.]

In order to make the alliance between these two nations effective it is necessary that they be connected by rail. This can be done either through Poland or Rumania. The former is hostile to Russia; the latter has apparently agreed to a railroad through its territory. The difficulties to such a railroad are considered by the author to be insuperable, especially as a four track line is considered necessary, so that both Russian as well as standard gauge trains can operate. The Austrians constructed a narrow gauge railroad over part of the route, but a standard gauge would require complete new construction. The author believes any statements about a railroad through the Carpathians to be exaggerations.

(42) STIEFKIND MARSCH. [Marching.]

A discussion of march discipline. The new German scheme is to have the infantry march forty minutes, halt twenty. During these twenty minutes the motorized and animal-drawn serials advance by bounds, frequently into the zone of the advance guard. For a march of 21 miles, a three-hour halt from 11:40 AM to 3:00 PM is recommended. Total time on road from 6:00 AM to 6:40 PM.

18 October 1936

(43) JENA UND AUERSTEDT—EIN RÜCKBLICK. [Jena and Auerstedt in retrospect.] Captain Meltzer

An historical analysis in which the German defeat at Jena is not blamed upon a second grade army, but upon a geometric type of tactics and strategy, where everything was done according to rules, instead of by the judgement and intellect of great leaders. The same generation became outstanding in 1815.

(44) STUDIE ÜBER OPERATIONSPLÄNE UND KRIEGSWIRKLICHKEIT. [A study of war plans and the realities of war.] (III) General Wetzell

(45) DEUTSCHE UND FRANZÖSISCHE ARTILLERIEORGANISATION IM KRIEGE. [German versus French artillery control during the World War.] Major Köhler

This article is a brief summary of the essential differences between the two systems of artillery staff employment. At the outbreak of the war the German corps and army commanders did not have specially designated artillery staff officers, whereas the French did. The author thinks the German system worked all right. Later on, however, counterbattery missions became more prominent coupled with the mass employment of artillery, special artillery commanders and staff officers were employed at all higher headquarters. The French introduced a centralized organization for the exchange of opinions of artillery commanders, and for the enunciation of a coordinated artillery doctrine, based upon current experiences. The Germans had no such coordination beyond their firing schools, and it is the belief of the author that they should establish a centralized headquarters where all artillery doctrine would be investigated, experimented, coordinated and from which it would be uniformly disseminated to the service.

(46) DIE NEUE ITALIENISCHE AFRIKAARMEE. [The new Italian army of Africa.]

An analysis of the present Italian colonial procedure. Interesting merely is the possibility that Ethiopia, a country without cities, may develop them by using the army posts, garrisoned by native troops, as the nucleus for future cities, based on the Roman example. Herein coordination between the military and civil administrations is particularly called for.

(47) GIBT ES EINE KRIEGS- ODER WEHRWIRTSCHAFT? [Is there a form of economics pertinent to war alone?] Captain Löhr

This is a reply to Captain Ruprecht's article in a previous number. The author emphasizes that political economic principles and the demands of industrial mobilization are frequently in conflict, and that it is the duty of the government to bring the two into harmony, bearing in mind the importance of military factors. For example, the self-sufficiency of a nation in raw materials is inadvisable in times of peace, but may be essential in time of war. The location of certain vital industries in strategically vulnerable areas may be demanded by economic factors, but undesirable in time of war. National defense demands that a nation should not be

industrially vulnerable in times of peace, so that it can not be sensitive to economic pressure. On the other hand, it is futile to starve a population on war time rations, when no need exists therefor. The author therefore develops a third category of economics, the "Economics of Defense," which is a middle road between the unrestricted political economy of peace and industrial mobilization in time of war.

(48) FEST EINGETeilTE SPÄHTRUPPS. [Permanently detailed scouts in the infantry company.]

This is an article written in opposition to an argument against such permanent detail. The author claims that in a professional army every man can be trained as a scout, but in a draft army, specialization is necessary. In reply to the idea that these specialists might be killed early in the war, or away on other detail, he states that this is also true of all other specialists. He believes that the scout should be a specialist and trained for patrol duty, just like a machine gunner or communications man.

25 October 1936

(49) DIE TAKTIK DER MASCHINENGEWEHRE. [Machine gun tactics.] Major Hoppe

The World War demonstrated the terrific effect of machine guns. Properly emplaced and used they were the mainstay of the infantry in defense; they broke up the hostile attack, and were the support from which the counterattack was launched. After the war the lessons learned were soon forgotten, especially since the machine guns had been equipped with instruments permitting indirect fire. In the German Reichswehr another reason was the reduction in artillery, which called for the employment of the machine gun as artillery in filling the gaps of the inadequate larger weapon. Machine guns were pushed farther and farther forward, so as to gain the maximum range of 3,500 yards. Then they were to be shifted to open positions, when their minimum range was no longer effective. The combatting of the hostile reserves was of course forgotten, especially as they were rarely represented during field exercises.

It is desirable therefore to review history a bit. In 1914 the German infantry had one machine gun company per regiment. The fire fight was conducted by the rifle companies, and when the unit took up the defense, the machine guns were placed in the main line of resistance to cover dead spots, and act by flanking fire. In the fall of 1915 the British attack at Loos was repulsed by the machine guns in depth. This day of Loos may be said to be the birthday of the machine gun; their terrible effectiveness was recognized, and the doctrine of their employment in depth was recognized. From that day on machine guns were sited in depth, and only a few silent guns, well camouflaged, were left in the front line. The mass of the machine guns was arranged in a checkerboard formation in rear. They were multiplied, the one company per regiment had become three by 1916, and additional units were established for corps and army use. The light machine gun was introduced principally to release additional heavy machine guns from the front line, and to enable the rifle companies to conduct their own fire fight at close ranges.

The principal objection to the employment of the machine gun depth was the fact that they were silent until the enemy had broken through the main line of resistance, and that this employment violated the principle of bringing the maximum fire power available against the enemy before he reached the main line of resistance. During the night the machine guns were moved forward to break up night attacks and to harass the enemy. If the enemy attacked at dawn, many guns had not as yet returned to their daylight positions. To prevent this a system of indirect fires was developed by means of which the machine guns were able to fire from their daylight positions. In this way the machine guns were both able to form an "iron defense" in rear, as well as fire upon the enemy beyond the effective range of the light machine gun and the rifle.

Continuing along these lines, we should today develop this employment of the heavy machine gun. There is no longer any shortage of artillery in the German army. Machine gun units are adequately equipped with

instruments for indirect laying. The necessity for the forward emplacement of the machine gun no longer exists, especially as at its extreme ranges the effect is purely a moral one. The trajectory at 3,000 yards is so curved that the advantage of grazing fire is lost, and the angle of incidence is so great, that but little actual damage is done.

Attack and defense in the air and on the ground would therefore be somewhat as follows:

In the air:—Above—pursuit aviation; then the heavy antiaircraft artillery; then the antiaircraft artillery; then antiaircraft artillery cannon (37-mm.); under 6,000 feet the antiaircraft machine guns; under 3,000 feet the heavy machine guns and light machine guns; up to 1,500 feet the rifle.

On the ground:—Extreme distances—the bomber; then the heavy artillery; beyond 3,000 yards the light artillery, heavy machine guns and infantry cannon; under 1,200 yards the heavy and light machine guns; under 800 yards the light machine gun, the rifle, and certain hidden heavy machine guns.

(50) DIE BEDEUTUNG DES GELÄNDES FÜR PANZER-, MOTORISIERTE UND KAVALLERIEVERBÄNDE. [The importance of terrain in the defense against mechanized and horse cavalry.]

The author compliments the German army on the fact that they have realized that a division lacks adequate antitank defenses, and its only security against tank attack lies in seeking the protection of suitable terrain. He states that this is being done in field exercises, but that apparently few officers realize what constitutes "tank proof" terrain. They underestimate the cross-country ability of the modern mechanized unit. The author therefore lists what he considers to be the only "tank proof" terrain features:

- (a) Mountainous regions, with precipices, ravines, steep sides.
- (b) Large areas of swamp land.
- (c) Trackless forests.
- (d) Rivers at least 18 feet wide, and at least 39 inches deep, with steep banks; canals particularly suitable.
- (e) Thickly populated industrial and mining regions.

The author then warns that horse cavalry can attack no better from most of these terrain obstacles. It has a worse time in swamps and is more vulnerable in thickly populated areas than the tank. However, he believes that the mission of modern cavalry is that of mounted infantry that has the advantage over mechanized forces in being able to remain closer to its means of transportation, can cover trackless forests better, and is also superior in river crossings as it requires fewer preparations. The author believes the missions for horse cavalry in modern war will be primarily defensive ones, such as the holding of the edges of forests, river defense, etc.

In conclusion the author states that "tank proof" terrain is by no means synonymous with "horse cavalry" terrain.

(51) DIE FESTUNG IM ZUKUNFTSKRIEGE. [The importance of fortifications in future wars.] Major General Klingbeil

This German expert on fortifications presents a brief article on the modern fortress, dwelling at length upon the present French system, which combines the utilization of terrain, with obstacles, pill boxes, subterranean barracks, and organization in depth, to produce an impenetrable defensive line from Switzerland to Belgium and then partially through that country.

The author mentions the fact that the nation which has the best system of bridges, over which mechanized forces can travel without reduced distances of diminished speed, will have a tremendous strategic advantage over one less well equipped with such permanent bridges.

The article in general confirms the information already published in popular magazines with regard to the French system of defense.

(52) KRIEGSAKTEN UND KRIEGSGESCHICHTE. [War diaries and official history.] Lieut. Colonel Roesner

An abstract of this article will appear in the next issue of the Quarterly.

(53) *LEBENSMITTELVERSORGUNG IN ENGLAND WÄHREND DES KRIEGES.* [The problem of food supply for England during the World War.]

4 November 1936

(54) *ZIELE UND WEGE FÜR DAS STUDIUM DER KRIEGSGESCHICHTE. ERLÄUTERT AM GEFECHT VON BZOWICA (10. 8. 1916).* [Ways and means of studying military history. Exemplified by the skirmish at Bzowica, 10 August 1916.] Lieut. Colonel Mahlmann

An abstract of this article will appear in the next issue of the Quarterly.

(55) *DIE AUSBILDUNG DER FÜHRER DES BEURLAUTENSTANDES.* [Training of reserve officers.] Captain Auer

A short article on the subject, applicable to the German system, in which each officer does some duty with troops, some at schools, and the remainder at home. Primarily interesting is the emphasis placed upon training in the appreciation of terrain.

(56) *GEDANKEN ÜBER DIE GEFECHTSAUSBILDUNG EINER PANZER-ABWEHR-ABTEILUNG.* [Combat training for an antitank unit.] Lieut. Colonel v. Zanthier

The author, who is in command of one of the new German antitank units, emphasizes the following:

The unit should have a fanatical desire to furnish tank protection as ordered. Otherwise the difficulties would be too great.

They must be trained in going into action in each of the following three methods:

- (a) As a mobile reserve, centrally located.
- (b) In readiness, close to the anticipated position.
- (c) In position, sited, and camouflaged.

Each has its advantages and disadvantages, and any may be used, depending upon the situation.

(57) *NOCHMALS: LUFTSCHUTZ EINES ARMEEKORPS.* [Antiaircraft defense of a corps.] Major Pickert

This is a criticism of the illustrative problem published in the December 1936 issue of "The Command and General Staff School Quarterly" (page 49). The present critic finds fault with the problem in general as follows:

He disagrees with the proposed organization of the antiaircraft artillery regiment. He believes the regiment has too many spare parts. He would place searchlights and the antiaircraft artillery intelligence service unit under army, and just have two battalions: a gun battalion and a machine gun battalion.

The author differs as to the defense of river crossings, and also of the development area. He believes that the gun battalion should always be employed as a coordinated unit. He also believes that the gun battalion commander should be at headquarters, unless the regimental commander is there.

(58) *ORGANISATION, BEWAFFNUNG UND AUSRÜSTUNG ÖSTERREICHISCHER INFANTERIEEINHEITEN.* [The organization and equipment of the Austrian infantry.]

A brief summary of the new Austrian units. Noticeable is the Italian rather than German influence upon organization and equipment. The Austrians are not as yet motorized, but are working on the problem. Interesting to American readers is the fact that each squad is equipped with a submachine gun. It also has a light machine gun, and in each squad a man who does nothing but carry extra barrels for this light machine gun. It appears that this weapon heats up readily, and is kept firing by the substitution of new gun barrels. The larger units are organized similarly to ours, but Austria adheres to the separate battalion, rather than to the regiment as an administrative and tactical unit. The battalion, therefore, is self-contained, and the regiment is nothing but a group of three battalions and a headquarters company, but without service company. A new uniform based upon British and Italian experience is being designed. Infantry packs are usually carried by transportation. It is planned to give each platoon a separate vehicle.

(59) JAGDKOMMANDOS. [Shock troops.] Steffmann

This article is of particular interest in view of allied criticism of the German method of having divided their army into two categories: the shock troops, and holding troops. The author here discusses the need of a group of volunteers organized into a platoon of seven squads, led by a daredevil, familiar with the enemy's language, and willing to risk anything. These units raid hostile communication, rearward headquarters, install listening cables, destroy bridges in back of the hostile line, bring in prisoners, etc. They must be volunteers, and in return are specially treated in the matter of leaves, quarters, food, and decorations. The author believes such units are desirable.

11 November 1936

(60) NEUZEITLICHE KRIEGSSCHIFFSTYPEN. [Modern battleships.] Admiral Meurer

A brief resumé of the world's naval situation, explaining in elementary terms the various types of naval vessels and their tactical employment.

(61) WINKE FÜR DAS WINTERLICHE KRIEGSSPIEL. [Suggestions for map maneuvers.] Lieut. General Marx

The author, a constant and constructive contributor to the "Wochenblatt," makes some suggestions applicable to map maneuvers which are of interest:

(a) He would omit all geographic names from the master map, requiring the player to orient himself accordingly on his own.

(b) Players, who normally would not be in the same vicinity, are all united during the play. Thereby all mistakes of transmission of information, misinterpretation thereof, etc., is avoided.

(i) Information that comes by messenger, is written and sent to the addressee.

(ii) Information that is verbally transmitted is delivered verbally by a cadet or intelligent enlisted man.

(iii) All players are in separate rooms, and connected with each other by telephone.

(c) Do not use the "1st Division," etc., but use troop units of the actual organization that would be called out in the prospective engagement. Use foreign units as they are actually organized, for Red.

(d) Occasionally bring in intercepted messages in the "Red" language, or send in "Red" speaking prisoners.

(e) Use the terrain in the vicinity of the garrison, so that terrain exercises and tactical rides can be coordinated with the maneuver later in the season.

The author concludes by stating that the important thing in map maneuvers is the avoidance of "schema," or routine. New developments should be introduced each year. Avoid fixed percentages of casualties; use dice occasionally to determine results, and MAKE IT INTERESTING.

(62) GEDANKEN ÜBER GLIEDERUNG UND AUSSTATTUNG NEUZEITLICHER PIONIERVERBÄNDE. [The organization and equipment of engineer troops.]

This very interesting article discusses the increased demands placed upon the engineers by the modern tendency to march cross-country, by the increased demand for road blocks, and their removal, and finally by the modern technique of river crossings on a broad front.

The author objects to the present organization of the German infantry division because by its very nature the attachment of engineer troops to the infantry seems unavoidable. He gives excellent reasons why engineers should not be attached. He suggests instead the organization of an engineer company in each infantry regiment, because there is never a lack of engineer missions in any tactical situation. He would equip the engineer company with power saws for felling trees, give them plenty of explosives for demolitions, floating bags for river crossings, and K-rolls (the new German antitank obstacle) for use in road blocks. The training of the company would be primarily the construction and removal of road blocks. In times

of peace the inadequacy of engineer troops is usually not apparent, because most construction is simulated, but it would be too bad to find out after war had begun that the army was inadequately supplied with engineer troops.

(63) KAMPFWAGENBAU IN U.S.A. [Tank construction in the United States.] Bach

This is the first of a series of two articles on the American tank, and is the series which created such a commotion in the daily press at the time of their publication.

The author states that the "Medium Tank," T-3, E-2, is an excellent weapon as well as the T-4 Combat Car. He belittles the model 1931 Christie, which Russia has improved and is using in quantity. He likes the armored car of Christie, model 1933. He emphasizes that the American Army does not expect an immediate invasion, being able to afford the "luxury" of several months of mobilization, while the navy and air force furnish security.

MILITARY ENGINEER

November-December 1936

- (1) WATERWAY IMPROVEMENTS IN ALASKA. Captain Noyes
- (2) SOME LEGAL ASPECTS OF THE SPANISH CIVIL WAR. Major Bauer
- (3) ROAD CONSTRUCTION IN THE COMBAT ZONE. Lieut.Colonel Besson
- (4) ROAD RECONNAISSANCE BY MOTOR. Colonel Pancoast
- (5) STRATEGIC MINERAL SUPPLIES. 8. MERCURY. Major Roush
- (6) THE FORT PECK PROJECT. Lieut.Colonel Larkin
- (7) BUILDING THE FORT PECK DAM. Captain Ogden
- (8) ENGINEERS IN SECOND ARMY MANEUVERS. Lieutenant Abrams
- (9) DANZIG AND THE POLISH CORRIDOR. Major Reynolds
- (10) MADDEN DAM, SLUICeways AND OUTLETS. O'Shaughnessy
- (11) WARTIME SHIPS OF STONE. Watt
- (12) SUMMER RESERVE TRAINING AT FORT BELVOIR. Captain Pote

January-February 1937

- (13) EMERGENCY MACHINE TOOL PROCUREMENT. Lieut.Commander Harrison
- (14) STABILIZING MILITARY ROADS. Lieut.Colonel Long
- (15) PLANE COÖRDINATE SYSTEMS IN REGIONAL SURVEYS. Adams
- (16) AIR CORPS SCHOOLS. Major General Westover
- (17) THE FORT PECK DAM TUNNELS. Captain Pence
- (18) FORT PECK DAM SPILLWAY. Captain Hardin
- (19) EMBANKMENT OF MARE ISLAND CAUSEWAY. Lieut.Commander Moeller
- (20) THE STORY OF THE COAST GUARD. Lieutenant Gray
- (21) THE NEED FOR MAPS. Bowie
- (22) ENGINEER REQUIREMENTS FOR THE INFANTRY DIVISION. Lieut. Colonel Besson
- (23) STRATEGIC MINERAL SUPPLIES. 9. ANTIMONY. Major Roush
- (24) THE SURVEY OF THE GULF OF PARIA. Anderson
- (25) MADDEN DAM CONCRETE TEMPERATURES. Wilson
- (26) LOCK FILLING AT ST. MARYS FALL CANAL. Edmands

MILITARY SURGEON

November 1936

- (1) THE UNITED STATES ARMY MEDICAL DEPARTMENT 1861 TO 1865. Lieut.Colonel Ryons
- (2) AN OUTBREAK OF TYPHOID FEVER IN A CAMP OF THE C.C.C. Colonel Tasker
- (3) MESS-ECONOMY. Lieut.Colonel Shuman
- (4) WHY THE FLIGHT SURGEON? Captain Jensen
- (5) THE SURGICAL HOSPITAL. Colonel Hetrick

(6) DISSEMINATION OF CHOLERA BY THE 38TH INFANTRY IN 1867. Lieut.Colonel Lull

(7) A METHOD OF INITIATING PNEUMOTHORAX IN THE TROPICS. Captain Skinner

December 1936

(8) THE SERVICE OF THE VETERINARY CORPS IN THE MOTORIZED COMBAT ARMIES. Lieut.Colonel McKim

January 1937

(9) THE CENTINARY OF THE ARMY MEDICAL LIBRARY. Colonel Jones

(10) THE ORATION COMMEMORATING THE ONE HUNDRETH ANNIVERSARY OF THE FOUNDING OF THE ARMY MEDICAL LIBRARY, WASHINGTON. Sir Humphrey Davy Rolleston

(11) BUILDINGS FOR THE ARMY MEDICAL LIBRARY. Major Hume

NAVAL INSTITUTE PROCEEDINGS

November 1936

(1) THE AIRPLANE IN INTERNATIONAL LAW. Lieutenant McLean

(2) LEGAL BASES FOR THE USE OF FOREIGN ARMED FORCES IN CHINA. Captain Carlson

(3) MILITARY EFFECTIVENESS. Safford

(4) ORIGIN OF THE UNITED STATES NAVY. Morgan

(5) THE SPIRIT THAT WINS. Lieutenant Sanders

(6) THE ZEISS PLANETARIUM. Lieut.Commander Myers

(7) THE EVOLUTION OF THE SEXTANT. Commodore Clark

(8) CREEP, OR LATITUDE ERROR, IN TORPEDO FIRE. Lieutenant Evans

(9) INTERSHIP COMMUNICATION—ITS IMPORTANCE IN WAR AND PEACE. Ensign Welch

December 1936

(10) THE RESULTS OF JUTLAND. Lieutenant Miles

(11) FIGHTING THE U-BOATS. Hanks

(12) SUBMARINES AND THE LONDON TREATY. Commander Hazlett, Jr.

(13) UNITED STATES SUBMARINE CHASERS AT GIBRALTAR, NOVEMBER, 1918. Commander Raguet

(14) THE BRAZILIAN NAVY IN THE WORLD WAR. Robinson

(15) FUTURE USE OF SUBMARINES. Lieutenant Hubbard

(16) THE FIRST AMERICAN SUBMARINE. Lieutenant Sanders

(17) ROBERT FULTON'S TURTLE BOAT. Commander Rowbotham, British Navy

(18) WHAT IS MODERN NAVIGATION? Master Mariner Long

(19) EXCESS WEIGHT IN SUBMARINES. Lieutenant Rucker

January 1937

(20) THE GENESIS OF NAVAL POLICIES. Lieutenant Commander Moran

(21) THE NAVY AND THE PRESS DURING THE CIVIL WAR. West

(22) PAYING COMBATANTS IN FOREIGN WARS. Lieutenant Commander Seligman

(23) THE CURSE OF SANTO DOMINGO. Captain Boyden

(24) CAPTAIN ALLEN'S BATTLE WITH THE ENGLISH BARGE. Lieutenant Commander Dow

(25) A GREAT SHIP'S LAST MOORING. Simons

PIONIERE (Germany)

By Major F. Doring, Infantry

August 1936

(1) FRIEDRICH DER GROSZE ALS MEISTER DER BEFESTIGUNGSKUNST. [Frederick the Great as master of the art of fortification.] Major Dinter

In his book, "Les principes généraux de la guerre," written after the last Silesian War, Frederick rejected the principle of the war of fortification,

in opposition to the views of his contemporaries who often considered the reduction of a fortress as the main objective of a campaign. He believed that a war could only be decided by a complete victory over the enemy in the field. In spite of these views, Frederick regarded fortress warfare as a necessary evil, that might have to be undertaken in certain circumstances. He introduced the study of fortification into the Prussian Army. He increased the number of engineer officers from 39 to 72 and selected candidates for the engineer corps himself.

Frederick laid down tactical principles to be observed in future construction. Flank defense and suitable communications were insisted upon. Each main fortress should have detailed works, incapable of being taken by a *coup de main*. The fortresses of Neisse, Silberberg and Graudenz are described. These were built under Frederick's orders and show a masterly attention to detail.

(2) DIE FESTUNG METZ. [The Fortress of Metz.] (I) Colonel Heye, Retired

An account of the history of Metz and its development as a fortress.

(3) ELEKTRISCHE HINDERNISSE IM WELTKRIEG. [Electrified obstacles in the World War.] Captain Kurhardt

Early in 1915 the Germans made the first experiments with high tension electricity as a means of defense in the front line of the Seventh Army in the Chemin des Dames. The current was obtained by power stations and conveyed by open wires up to a distance of from 6 to 9 miles from the front and from there by cable to the front line.

The obstacle consisted of two wooden posts, three yards apart, the lower ends of which had been dipped twice into hot tar. Each row formed a fence with three horizontal rows of plain wire; barbed wire was crisscrossed between the fences.

It was a definite rule that between electrified wires and entanglements a distance of 10 yards must exist; the same distance was adhered to between the electrified wire and the trench. Experience during the war showed that the wires still functioned after a heavy artillery bombardment and that the simple construction adopted by the Germans proved more effective than the elaborate form used by the French with its special insulators and wires. The article is well illustrated.

(4) DER MINENWERFER EINE PIONIERWAFFE. [The trench mortar—an engineer weapon.] Colonel Biermann

An account of the development of the trench mortar, from its first introduction by the Japanese at Port Arthur in 1904-05, to the experimental stage with the German engineers in the years preceding the war, and to its final development during the war.

(5) ERFAHRUNGEN AUS DEM GEBIRGSKRIEG. [Experiences of mountain warfare.] Colonel Winkelmann, Retired

The author relates in this article his personal experiences on the Carpathian front during the war. The engineer and labor companies were mostly employed in road construction, erection of shelters for troops and miscellaneous work on the line of communications.

(6) KRAFTFAHRAUSBILDUNG UND MOTORSPORT DER PIONIERE. [Training of engineers in the handling of motor vehicles.] Major von Ahlfen

The author believes that engineer troops do not get sufficient training in the handling of motor vehicles under conditions that they might have to experience in time of war, and suggests various schemes for testing drivers over a course of wooded and hilly country at night without lights and in snow and rain.

(7) KRIEGSGEOLOGIE. [Geology in time of war.] Professor Scupin

QUARTERMASTER REVIEW

November-December 1936

(1) HOME OF THE SIGNAL CORPS. Captain Antonovich

(2) PRINCIPLES OF WAR. Major Rowan

(3) MODERN CARTOGRAPHERS TAKE TO THE AIR. Davidson

- (4) OPERATION OF QUARTERMASTER SECTION, SAN FRANCISCO GENERAL DEPOT. Colonel Aleshire
- (5) TROOP TRANSPORT BY MOTOR BUS. Lieut. Colonel Mills
- (6) THE ARMY COMES CLEAN. Lieutenant Carlier
- (7) KNOW THE ANSWERS! Major Kindervater
- (8) GUIDE FOR SALES OFFICERS, U.S. ARMY. Major Porter, and J.O. Wilson
- (9) LEADERSHIP AND MORALE. Major Holt
- (10) THE QUARTERMASTER STOREHOUSE OF KNOWLEDGE. PROBLEM No. VI

RESERVE OFFICER
October 1936

- (1) MILITARY TRAINING IN THE C.C.C.
- (2) ITALIAN GRAND MANEUVERS
- (3) CAVALRY, KING OF BATTLE
- (4) JOSHUA—THE STRATEGIST. Captain Lively

November 1936

- (5) HAS THE ARMY TOO MUCH RADIO? Major General Allison
- (6) GERMAN COLONIAL VISIONS. Major General "A"
- (7) TANKS IN INDIA
- (8) WHEN TANK MEETS TANK

December 1936

- (9) MY KINGDOM FOR A HORSE! Lieut. Colonel T.J. Johnson
- (10) ITALY'S PROBLEMS AND POLICIES. Major General "A"
- (11) ROADS AND ROADS AND ROADS
- (12) MOTORS IN MARCH COLUMN
- (13) FRENCH ARMY OF THE AIR
- (14) THE NEW DIVISION

REVUE DE L'ARMEE DE L'AIR (France)

By Lieutenant Colonel L.H. Brereton, Air Corps

July 1936

(1) A PROPOS D'UN LIVRE. [Concerning a book.] By the Editor
Comments on a newly published work entitled "Bombardment Aviation" ("L'Aviation de bombardement," by C. Rougeron, Ch. Engr. Naval Construction). The work is in two volumes.

Book I—Bombardment and Pursuit Aviation.—Analyses and discusses the factors of speed, formations, and some consideration of the Douhet doctrine.

Book II—Bombardment and Artillery.—Technique of maneuver; for attack; for defense against interceptor aviation; against anti-aircraft artillery. The author is of the opinion that present bombing tactics must be changed radically.

Book III—Bombardment Airplane Matériel.—Discusses necessity for homogeneous equipment.

Book IV—The Bomb and Torpedo. Fused Bombs. Flying Bombs.—Employment against naval vessels.

Book V—Methods of Employment.

Book VI—Bombardment in the Ground War.

Book VII—Bombardment in the Naval Engagement.—The author foresees a complete revolution in present conceptions of the constitution and tactics of the fleet.

(2) DEUX POINTS DE VUE SUR LA POLITIQUE INDUSTRIELLE EN AÉRONAUTIQUE. [Two viewpoints of the policy of the aircraft industry.] Captain de l'Escaille

(3) PAYSAGES URBAINS. [Urban areas.] Captain Thoumin
A discussion of air reconnaissance possibilities as affected by urban and suburban terrain and structures.

(4) LA GUERRE AÉRO-MARITIME DANS LES FLANDRES. [The air-sea war in Flanders.] Lieutenant Barjot

(5) A LA CONQUÊTE DE LA STRATOSPHERE. [Conquering the stratosphere.] (I) Bernson

August 1936

(6) NOTE ÉDITORIALE. LE MINISTÈRE DE LA DÉFENSE NATIONALE. [Editorial Note: The Minister of National Defense.]

The author mentions recent comments in French publications, notably by Marshal Pétain, and presents a viewpoint which favors a close coordination and supervision of the three military ministries of Air, Army and Navy, and a revision in the existing conception of their comparative importance.

This should be accomplished by the creation of:

- (a) An agency to study problems relating to national defense.
- (b) A general staff to elaborate and solve such problems.
- (c) A military authority to direct the necessary action.
- (d) A responsible minister.

The author admits many difficulties arising in the organization suggested, among which are: The fear of a military "coup d'état" and the difficulty of fulfilling the duties of the office. It is felt, however, that the disadvantages are out-weighed by the evident necessity for a military authority superior to the general staff of the three defense arms—the Army, Navy, and Air.

This military authority would supervise the programs of the several arms and make such recommendations to the minister as would eliminate duplication of technical supply and procurement procedure, and control allocation of funds.

The author is of the opinion that inasmuch as naval operations are particularly sensitive to new conceptions of employment as a result of the development of air power, the first chief of such a general staff should be a naval strategist.

A serious obstacle to the organization proposed is the difficulty of organizing the civil power to assure proper independence of action, and to avoid exposing it to the vicissitudes of political expediency and manipulation with change of ministries.

The author favors as the best solution the establishment of a Ministry of State for National Defense as a full member of the cabinet. The minister would be charged specifically, by delegation of authority from the government, with complete authority to coordinate all matters concerning the national defense. It is hoped that the power of the government to delegate authority to such an official would guarantee reasonable tenure of office, in spite of changing governments, thus assuring a continuance of policies.

The author stresses the necessity of avoiding half measures in the solution of the vital problem—"To achieve unity of action, not merely coordination, in the preparation and execution of the military effort of the nation."

(7) LE TIR PAR LE TRAVERS À BORD DES AVIONS RAPIDES. [Aerial fire towards the beam in high speed airplanes.] de Valorgier

A discussion of the influence of the relative wind pressure on the trajectory of a projectile fired from high speed aircraft at deflections of greater than ten degrees with the direction of flight.

(8) EMPLOI DES BALLONS DANS LA DÉFENSE AÉRIENNE. [Employment of balloons in defense against air attack.] Major Lucas

A short history of the use of the protective balloon barrage by the major combatants during the World War. The author recommends studies and experiments with a view to developing protective balloons capable of ascension to the service altitudes of bombing aircraft.

(9) A LA CONQUÊTE DE LA STRATOSPHERE. [Conquering the stratosphere.] (II) Bernson

A description of the stratosphere flight of Captains Stevens and Anderson.

(10) NOTES ET SOUVENIRS SUR LA CRÉATION DE L'AVIATION MILITAIRE FRANÇAISE. [Notes on the development of French military aviation.] (I) Lieut.Colonel Bellenger

September 1936

(11) LES GRANDES VITESSES VONT-ELLES TUER LA CHASSE? [Will great speeds eliminate pursuit aviation?] Odier and Garnier

A discussion of the increasing difficulties of successful air combat. The limitations of effective fire as affected by air speed are discussed, using as a basis for argument, a pursuit of one plane by another. The author considers as an example a pursuit plane of about 325 miles speed pursuing a plane of about 300 miles per hour speed. Each plane is armed with a Hispano Suiza machine gun, caliber 20-mm., muzzle velocity 830 yards a second, rate of fire 400 rounds per minute. The authors demonstrate mathematically that the pursued plane firing to the rear and opening fire at a range of 3,000 yards, can deliver 310 rounds at his pursuer before the latter can deliver a correspondingly efficient fire from a ballistic point of view.

(12) CONSIDÉRATIONS MÉDICALES SUR LE PARACHUTISME. [Medical notes on parachute jumping.] Major Flamme

(13) LE BOMBARDEMENT EN VOL RASANT. [Bombardment at minimum altitudes.] Chief Engineer Rougeron

An extract from the work of the above author entitled "L'Aviation de bombardement." The article discusses the ballistics of low altitude bombing, conclusions as to accuracy and tactical value of such methods are covered in texts in existence in our air corps, dealing principally with the tactics and technique of attack aviation.

(14) NOTES ET SOUVENIRS SUR LA CRÉATION DE L'AVIATION MILITAIRE FRANÇAISE. [Notes on the development of French military aviation.] (II) Lieut.Colonel Bellenger

REVUE D'ARTILLERIE (France)

By Major R.G. Tindall, Infantry

July 1936

(1) LE CRÉATEUR DE L'ARTILLERIE D'ASSAUT. [The creator of tanks.] Major Deygas

The life of the late General Estienne and his services to France.

(2) DÉTERMINATION DU NORD PAR LA POLAIRE ET PAR UNE ÉTOILE AUXILIAIRE BIEN CHOISIE. [Determination of north by the polar star and a well-chosen auxiliary star.] General Pagezy

(3) LA CENTRALISATION DE LA COMMANDE DU TIR PAR LES COORDONNÉES POLAIRES. [Centralization of fire direction by polar coordinates.] Major Greze

Discussion of a technical method of concentrating rapidly upon a known portion of a zone, the fire of a groupment (two or more battalions).

(4) ABAQUES DE TIR DE 75 DE MONTAGNE S MODÈLE 1928. [Graphic fire table for Schneider 75-mm. mountain gun, model 1928.] Captain Bouchet

(5) DEUX ANCIENS APPAREILS DE PROTECTION "Z." [Two old gas helmets.] Captain Collard

August 1936

(6) AU SUJET DU TIR FUSANT. [Concerning shrapnel fire.] Major Blanchet

The author concludes that with the 75-mm. gun at 6,000 yards, only fused shrapnel permits the neutralization, without excessive expenditure of munitions, of personnel occupying ditches, depressions, or shell holes. He then proceeds with an exhaustive discussion of the difficulties of the firing problem involved, and proposes solutions.

(7) MODERNISATION DES VOITURES DES ÉQUIPAGES MILITAIRES. [Modernization of military vehicles.] Captain Bourloton

The author is concerned with amelioration of existing vehicles, particularly with the use of pneumatic tires for horse-drawn vehicles.

- (8) LA CORRECTION DE SITE DANS LA PRÉPARATION DU TIR DU GROUPE PAR LA MÉTHODE DES COORDONNÉES POLAIRES. [Site correction in the preparation of the fire of the battalion by the method of polar coordinates.] Major Legroux

The author's purpose is to show that the employment of polar coordinates to permit rapid and precise battalion concentrations on visible objectives which must be rapidly neutralized can be extended to site correction by a graphic method. This method's principal application would be in broken country.

- (9) CONSOMMATION DE MUNITIONS DANS UN TIR SUR ZONE. [Munitions consumption in firing on a zone.] Lieut.Colonel Desrousseaux

September 1936

- (10) FIGURATION DES FEUX ET OBSERVATION AÉRIENNE. VÉRIFICATION DE LA PRÉCISION OBTENUE DANS LES EXERCICES EN COMMUN. [Representation of fire effect and aerial observation. Verification of precision obtained in common exercises.] General Balambois

The author proposes an economical method of training aerial observers for artillery missions, developing his scheme in great detail.

- (11) ÉCOLE À FEU DE GROUPE. [Battalion school of fire.] Lieut. Colonel de Mazenod

- (12) OBSERVATOIRES MOBILES D'ARTILLERIE. [Mobile artillery observation posts.] Captain Druene

- (13) CALCUL OU DÉTERMINATION RAPIDES DES PROLONGEMENTS DE TRAJECTOIRES. [Rapid calculation or determination of the prolongation of trajectories.] Captain Etasse

- (14) SUR UNE MÉTHODE DE PRÉPARATION DES TIRS. [A method of fire preparation.] Major Provost

REVUE DE CAVALERIE (France)

By Major L.K. Truscott, Jr., Cavalry

May-June 1936

- (1) LE CONCOURS HIPPIQUE DE 1936. [The Horse Show of 1936.] General Brécard

Comments on the horses, riders, and the influence of the horse show in developing young horsemen.

- (2) LE COMBAT DE JAROSLAWICE (21 AOUT 1914). [The battle of Jaroslawice, 21 August 1914.] Colonel Grobicki

An account of the great cavalry fight between the Austrian 4th Cavalry Division and the Russian 10th Cavalry Division during the early days of the World War. The author, now of the Polish Army, was a lieutenant of cavalry in the Austrian Army in 1914, and took an active part in the battle. Before writing the article, he visited Austria and consulted official records and numerous officers who took part in the action. He also has interviewed many former Russian officers who have since become officers in the Polish Army, and who took part in the action.

In this battle, the Austrian 4th Cavalry Division with two battalions of the 35th Infantry Regiment attached, was surprised, first, by fire of Russian artillery, and then by the Russian 10th Cavalry Division in a mounted attack. The Austrian 4th Cavalry Division was completely routed, losing in the cavalry division and the two infantry battalions, 821 killed, wounded and prisoners.

The battle illustrates, among other points:

A mounted attack, cavalry versus cavalry;

A mounted attack, cavalry versus infantry;

A mounted attack, cavalry versus artillery;

A mounted attack made under flanking fire of machine guns;

The deadly effect of artillery fire on unsheltered and surprised troops, especially green troops;

The necessity for marching by bounds, with proper reconnaissance and security measures, when contact is possible;

The necessity for prompt decision and energetic action by commanders.

The article is a detailed study of the operations of both sides, arranged in chronological order, and well illustrated with six sketches. It contains a detailed criticism of the operations of both sides, and ends with some general conclusions as to the possibilities of mounted combat today.

(3) NOTES D'HIPPISME AUX PAYS DU NORD. [Notes relating to horses in the north countries.] de Chevigny

Notes of a visit made in 1935 to Denmark, Norway and Sweden, for the purpose of inspecting breeding establishments, private and state-owned, in those countries.

(4) LA MOTOCYCLETTE AU COMBAT. [The motorcycle in combat.] Captain Grosjean

A study of the employment of the unarmored motorcycle in the combat zone. For messenger service, the author considers the solo motorcycle superior to the side car. The employment of the motorcycle units is considered for: transportation of means of fire (automatic rifles), and reconnaissance.

The author compares the advantages and disadvantages of the motorcycle with the auto-machine gun (armored car), under the headings: speed, radius of action, armament, mobility, noise, visibility, possibilities of observation, vulnerability, purchase price and maintenance. As a result of the comparison he deduces the general employment previously indicated, and concludes that the matériel should be of commercial type, and should be side cars rather than solo motorcycles. He further indicates that each side car should carry an automatic rifle with a circular mount permitting a traverse of about 250 degrees, and that in each squad of two cars (the smallest patrol unit) one side car should be mounted on the right, the other on the left of the motorcycle, thus providing all around fire; and that each magazine for the automatic rifle should hold from 50 to 100 cartridges.

(5) CHRONIQUE AUTOMOBILE.—LA SYNTHÈSE DES CARBURANTS. [Automobile chronicle. The composition of carburants (fuel).]

A study of processes of manufacture of synthetic fuel (gasoline substitute), the state of the industry, and its conditions relative to France.

July-August 1936

(6) RÉFLEXIONS SUR L'EMPLOI DE LA CAVALERIE BLINDÉE. [Thoughts on the employment of mechanized cavalry.] Captain du Jonchay

An abstract of this article will appear in the next issue of the Quarterly.

(7) CHEVAUX EN MONTAGNE. [Horses in mountains.] des Lauriers

The author points out that mechanization is necessary, and that horse and motor must exist side by side because the motor cannot everywhere, nor always, substitute for the horse.

The article describes a situation in 1916-1917, in which a reinforced division occupied a front of about 25 miles in mountainous country. Sector reserves had to be located at a distance of about 9 miles from the front. Motors could not reach the front; infantry with light packs required eight hours, with an additional delay for bringing up equipment. Division cavalry units could reach the front five or six hours before the infantry.

The author concludes that much can be expected of properly trained cavalry in mountainous country, and that in spite of the perfection of motors, it will be difficult to obtain from them any service actually analogous. A further conclusion is that reserves for troops operating in mountain country should be mounted.

(8) LE TOUR DE FRANCE MOTOCYCLISTE. [The motorcyclist tour of France.] Captain Chapelle

Description of the civil and military test, or race, which took place from 10 to 24 May, 1936.

(9) LE GÉNÉRAL CURÉLY, CAVALIER, CHEF ET SABREUR. [General Curély—cavalryman, leader, and brave soldier.] (1) Lieut.Colonel de Dalmassy

A sketch of the career of General Curély, a famous cavalryman of the Napoleonic period. This installment outlines that part of his career from his enlistment in 1793, to his promotion to major after the campaign of 1809. While reference is made to the various campaigns, the account deals primarily with the service—marches, actions, duties, promotions, and incidents—of General Curély. The author refers to General Curély as "the living example of the highest military virtues, sentiment of duty, dash, bravery, command, firmness, and kindness."

(10) CHRONIQUE AUTOMOBILE.—LES GAZOGÈNES POUR VÉHICULES AUTOMOBILES. [Automobile chronicle. Gas generators for automobiles.]

A description of a gas generator for automobiles, which generates gas from wood, charcoal, coal, coke, etc. The generator is still in the experimental stage.

REVUE D'INFANTERIE (France)

By Major R.G. Tindall, Infantry

July 1936

(1) DEUX ÉTUDES HISTORIQUES COMPARÉES: "LE PARFAIT CAPITAINE" ET "L'ESPRIT DU CHEVALIER DE FOLARD." [Two historical studies compared: "The Perfect Captain," and "The Spirit of the Knight de Folard."] General Lugand

An historical study of two seventeenth and eighteenth century military works, little known to American readers.

(2) UNE SOLUTION AU THÈME TACTIQUE PROPOSÉ AU CONCOURS D'ENTRÉE À L'ÉCOLE SUPÉRIEURE DE GUERRE EN 1936. [A solution to the tactical problem included in the entrance examinations of the Ecole de Guerre in 1936.] Major X

(3) BERTONCOURT: 30 AOUT 1914. [Bertoncourt, 30 August 1914.] General Douce

A continuation of the study of operations of the Moroccan Division and portions of the French IX Corps which blocked the German Third Army in front of Rethel.

(4) THÈMES TACTIQUES ALLEMANDS. [German tactical problems.] Major Quenot

The beginning of a discussion of six German tactical problems. The author insists that up to the moment of the decisive attack, German tactics are resolved into a series of actions which seem isolated in time and space and in which subordinate German leaders are required to exercise initiative at each instant. As a result, German infantry on the battlefield will be elusive and difficult of definition and capable of coping advantageously with any offensive action which has been dislocated by such methods of combat.

(5) RENDEMENT COMPARÉ DES CHARS ANGLAIS ET FRANÇAIS DURANT LA GUERRE 1914-1918. [Compared effectiveness of French and English tanks during the War of 1914-1918.] Lieut.Colonel Perré

Statistics showing losses in men and material and engagements.

August 1936

(6) COMBATS DE BATAILLON. [Battalion combats.] (I) Lieut.Colonel Lavelle

The author begins a series of articles on the experiences of various units of the 34th Brigade in 1914. The first article deals with the period up to 23 August 1914, during which no serious contact with the enemy was experienced by the brigade, but counter-orders and continual changes of cantonments made things rather trying. The brigade, which formed part of the IX Corps, was separated from that unit in the midst of a rail movement, being entrained and then ordered to detrain suddenly as result of the French defeat at Morhange. The author gives the impressions of field and company officers as the situation developed.

(7) L'OFFICIER DE RÉSERVE EN 1936. [The reserve officer in 1936.] Major Videcoq

(8) L'INFANTRIE ET LE PROBLÈME DES LOCALITÉS: I.—LA DÉFENSE. [Infantry and the problem of villages: I.—Defense.] Lieut. Colonel Desré

The author presents in published form a conference given by him at the Ecole de Guerre in 1933. The protection afforded by villages against tanks and armored vehicles he considers to be of immense advantage. Defended villages must not be too small and must be of solid masonry construction. (Few villages in the United States would meet his requirements.) At the beginning of a war and before large quantities of guns and munitions become available, the author rather leans toward defense of the edges of the village. He develops a solution and advances several historical examples, taken from rapidly-moving situations of 1918 to uphold his ideas. The village itself should be organized into redoubts with a central keep. It should flank adjacent portions of the position and its edges should be flanked by fire from adjacent areas and from the rear. A reserve a few hundred yards in rear of the village should be provided for counterattacks or to prevent the enemy from debouching from the village if he should capture it. The article goes into the greatest detail.

(9) ENGINES FUMIGÈNES. [Smoke-laying weapons.] By "X"

A discussion of the use of the new portable smoke-producing apparatus of the French infantry. The article in question, it is understood, is essentially the same as a new French regulation on the subject, about to be published. The apparatus is similar in idea to the smoke-candle. It weighs some 30 pounds and produces smoke for from 10 to 15 minutes. The purpose of the apparatus is to spread smoke on a certain zone of terrain so as to hide movements in that zone from hostile observers, or to place a curtain of smoke between two groups of enemy troops or between friendly troops and certain enemy observation posts. The apparatus is particularly suited for laying a curtain a short distance from the friendly front line. Examples of calculating the number necessary to produce a given result are included. Tanks have great difficulty progressing in a smoke cloud which considerably reduces their combat effectiveness, according to the author. The smoke emitted by the apparatus seems to be toxic.

(10) LA FORMATION DU SOUS-OFFICIER. [Training of noncommissioned officers.] Captain Poumeyrol

A discussion of the training and development of sergeants.

(11) CHARS CONTRE CHARS. [Tanks versus tanks.] Lieut. Colonel Perré

A detailed account of the only two encounters in the World War between tanks: Villers-Bretonneux, 24 April 1918, and Niergnies-Séranvillers, 8 October 1918. Both British and German sources were carefully examined and the author then deduces the following principles:

(a) Combats between tanks have the arithmetical rigidity of combats between armored naval vessels. No matter how brave or skillful the crew, a light cruiser has no chance against a battle cruiser except in flight.

(b) The danger which one armored vehicle offers to another is so great that any tank which sees a tank adversary should immediately abandon its mission and oppose the tank if capable of coping with it; in the contrary case it should hide or run away.

(c) Tank versus tank combats are fought at short range and last only a few instants. It is necessary to see the enemy first and open an accurate fire. Crews must be trained to watch the entire visible horizon and modern tanks must be provided with antitank armament in an all-around turret with good visibility.

(d) The only means of action of the tank in such an encounter is fire. All movement should be intended to favor the execution of this fire or to avoid the fire of the adversary.

(e) The tank is myopic and may well be ignorant of tank duels within 100 yards. Because of this fact there is no need in a tank versus tank combat to prepare combined maneuvers for tank units—each tank chooses its adversary and attacks.

(f) The infantry must not remain a passive spectator of a conflict between tanks; with its antitank weapons it can vigorously help its own side and receive and protect those tanks not capable of sustaining the struggle.

September 1936

- (12) MISE EN OEUVRE DES DESTRUCTIONS. [Execution of demolitions.] Colonel Thabard

The author takes the historic situation of the defense of the Marne on 9 September 1914 by detachments of the German First Army and makes a study of the execution of demolitions. This study goes into details of the action of echelons such as the infantry battalion and shows what might have been done. Actually in 1914 no demolitions were effected during the operations studied. The article will be of the greatest interest to those interested in demolitions and the technique of their execution.

- (13) QUELQUES DONNÉES TECHNIQUES SUR L'ARTILLERIE. [Some technical artillery data.] Lieut.Colonel de Mazenod

A discussion of the capabilities and limitations of the 75-mm. gun in the form of an artillery course for infantrymen, with technical matters reduced to their simplest form.

- (14) COMBATS DE BATAILLON. [Battalion combats.] (II) Lieut. Colonel Lavelle

The author continues his description of the combats of small units of the French 34th Brigade in August 1914.

- (15) L'INFANTERIE ET LE PROBLÈME DES LOCALITÉS: II.—L'ATTAQUE. [Infantry and the problem of villages: II.—Their attack.] Lieut.Colonel Desré

An exhaustive study of the problem of attacking European villages of masonry construction. The author concludes that such villages must be outflanked and enveloped in conjunction with a frontal attack. The outflanking by itself will never cause the fall of a village held by determined adversaries and the frontal attack has considerable importance. Moreover, the outflanking action, to have any direct influence on the village, must include an infantry progression along one or both lateral edges of the village. Only limited effectives should be engaged in the fight inside the village. The success of the outflanking movement depends in large measure upon the neutralization of automatic weapons in the village which execute flanking fire missions. The author sees a great need for tanks in both the frontal and outflanking actions. He concludes his study by the examination of two historical examples: the capture of Carency in May 1915 and of Villers-aux-Erables in August 1918.

The details of the attacking technique which the author proposes are of considerable interest, although their value to American officers is diminished by the comparatively flimsy construction of American towns and villages.

- (16) LA DÉFENSE D'ARRAS PAR LA BRIGADE MÉNISSIER. [The defense of Arras by Menissier's brigade.] Captain Villemain

Notes by an artillery liaison officer with a French infantry brigade from 4 to 24 October 1914 in the fighting around Arras during the Race to the Sea.

REVUE DU GENIE MILITAIRE (France)

By Lieutenant Colonel P.C. Bullard, Corps of Engineers

July-August 1936

- (1) PETIT GUIDE POUR LES TRAVAUX DE PEINTURE. [Brief guide for painting work.] (I) Captain Legrand

Classification and notes of the various materials, mixing, characteristics, and uses of paints for covering buildings, structures, etc.

- (2) PROJECTILES ET FORTIFICATION. [Projectiles and fortifications.] Lieut.Colonel Montigny

This study outlines the information published before 1914 in France and other countries on the subject of the effects of projectiles on fortifications. It is intended to facilitate the study of works published since the World War, including those concerning the effect of projectiles during the War.

(3) ETUDE DU CALCUL DES TAUX DE TRAVAIL SUBIS PAR LA TRAVÉE DU PONT DE PILOTS, TYPE NO 1. [Study of calculations of stresses in a span of the pile bridge, heavy, type No. 1.] Colonel Girard

A mathematical study to determine the allowable loads on this particular bridge.

September-October 1936

(4) PETIT GUIDE POUR LES TRAVAUX DE PEINTURE. [Brief guide for painting work.] (II) Captain Legrand

(5) ROUGET DE LISLE, OFFICIER DU GÉNIE. [Rouget de Lisle, Officer of Engineers.] Marguerite Henry-Rosier

Biographical sketch of the author of the "Marseillaise."

(6) LA RÉCEPTION DU GÉNÉRAL FAUCHER COMME DOCTEUR HONORIS CAUSA DE L'ÉCOLE POLYTECHNIQUE DE PRAGUE. [The award to General Faucher of the degree of Doctor honoris causa by the Polytechnique School of Prague.]

REVUE MILITAIRE FRANCAISE (France)

By Major C.R. Moore, Corps of Engineers

July 1936

(1) LE COMMANDEMENT EN CHEF DES ARMÉES FRANCAISES DU 15 MAI 1917 À L'ARMISTICE. [The Supreme Command of the French Armies from 15 May 1917 to the Armistice.] (I) General Laure

In his foreword General Laure states that while Marshal Pétain has decided not to write his memoirs, he has permitted a presentation of his ideas on organization and command, which will be useful in drawing lessons from the World War and in keeping the younger generations in touch with realities.

This article is continued in the two following issues. The author's discussion of Pétain's methods of restoring the morale of the French Army and of gaining and holding the confidence of the civil officials of France is of especial interest.

(2) ESSAI DE CLASSIFICATION POSITIVE DES CHARS DE COMBAT. [The classification of tanks.] Lieut.-Colonel Perré

In developing his proposed classification, which is based on weight, speed, radius of action, armor, armament, and equipment, the author reviews the characteristics of most tanks (other than French) which have been developed to date.

(3) ESSAI SUR L'AVANCEMENT. [A study on promotion.] Major Loustaunau-Lacau

A proposed system of promotion for officers of the French army based on a combination of seniority and selection.

August 1936

(4) LE COMMANDEMENT EN CHEF DES ARMÉES FRANCAISES DU 15 MAI 1917 À L'ARMISTICE. [The Supreme Command of the French Armies from 15 May 1917 to the Armistice.] (II) General Laure

Continued from the July issue.

(5) LE COMTE SCHLIEFFEN, ORGANISATEUR ET STRATÈGE. [Count Schlieffen, organizer and strategist.] (Conclusion) Major Courbis

The first two parts of this study appeared in the issues of May and June 1936. After consideration of such information on von Schlieffen as is available, which he admits to be incomplete, the author concludes that he cannot agree with those who profess an unbounded admiration for Count Schlieffen. In the frequent changes of war plans, the author believes that von Schlieffen often did not follow the sound principles that are so generally attributed to him.

(6) CAMPAGNES D'OUTRE-MER ET FORMATION DES OFFICIERS. [The development of leaders in colonial wars.] Major Andriot

After the war of 1870 it was said that one of the causes of the French defeat was that the previous experience of the leaders in Algeria and Mexico

had unfitted them for command against a highly skilled adversary. After the World War the success of Joffre, Gallieni, and Mangin was attributed to their training in colonial warfare.

Major Andriot resolves this apparent discrepancy in results by pointing out that in 1870 Chanzy and Faidherbe, both experienced in colonial campaigns, upheld the honor of French armies in that unhappy campaign. Colonial service is valuable in developing the habit of command, will power, initiative, self-reliance, endurance, and a knowledge of men. These qualities alone will not make successful leaders in modern warfare. Commanders must also know the art and science of employing large units against a well-equipped enemy. This knowledge is developed by personal effort and study. When officers add a knowledge of the science of modern warfare to the qualities of character developed in colonial campaigns, outstanding leaders are produced.

September 1936

(7) LE COMMANDEMENT EN CHEF DES ARMÉES FRANCAISES, DU 15 MAI 1917 A L'ARMISTICE. [The Supreme Command of the French Armies from 15 May 1917 to the Armistice.] (III) General Laure

The author concludes an excellent discussion of General Pétain in the role of commander-in-chief of the French armies.

(8) L'ARMÉE ALLEMANDE. SON HISTOIRE, SON ORGANISATION, SA TACTIQUE. [The history, organization, and tactics of the German Army.] (I) Major Carrias

The German army had its origin in the creation of the permanent army of Brandenburg in 1655. This army made possible the formation of Prussia in the beginning of the eighteenth century and later of modern Germany in the nineteenth century. The present article covers the history of the Prussian army. It is to be followed in later issues by the second and third parts which will deal with the German army until the Armistice in 1918, and the post-war German army respectively.

Part I—The Prussian Army: The origins of the Prussian Army (1655-1786); The decadence of the Prussian Army (1786-1806); The reorganization of the Prussian Army (1807-1859); The transformations of the Prussian Army (1859-1871).

(9) FONDATION DE L'ECOLE ROYALE MILITAIRE. [The founding of the Royal Military Academy.] Laulan

This school was founded during the reign of Louis XV about 1750, for the military education of the sons of noble families. For it were constructed the buildings occupied for the past sixty years by the Ecole Supérieure de Guerre. The author, who is librarian of the Ecole de Guerre, cites documentary evidence to prove that the real credit for the conception and the establishment of this institution should be given to Joseph Paris-Duverney (1684-1770) and not to Madame de Pompadour, as was done by the brothers Goncourt.

REVUE MILITAIRE SUISSE (Switzerland)

By Major T.R. Phillips, Coast Artillery Corps

June 1936

(1) PREMIERS ENSEIGNEMENTS DE LA GUERRE D'ABYSSINIE. [Principal lessons of the Abyssinian War.] General Rouquerol (See abstract, page 46)

(2) LE PRINCE EUGÈNE: UN HOMME ET UN SIÈCLE. [Prince Eugene: a man and an era.] Frischauer

This book, written in German for the 200th anniversary of the death of Prince Eugene, is given an extensive review from its French translation in this issue of the "Revue Militaire Suisse." The review is extremely interesting and gives an excellent picture of the character and performance of one of the greatest soldiers of history. The story of his enmity toward Louis XIV is worth repeating.

Louis XIV disliked physical feebleness and turned away with disgust from sickly and ugly beings. One day, in 1663, Prince Conti presented to

His Majesty a young man twenty years old whose face impressed him unfavorably. To tell the truth, the King knew him very well, but he affected ignorance of him. He was a youth of slight stature, extreme ugliness, a broken nose, an upper lip so short that it uncovered long teeth, almost black, and a receding chin.

Prince Conti, introduced into the reception hall, announced the "Chevalier de Carignan" to the King. Louis did not smile. He pretended not to recognize this displeasing face. "Sir," continued the introducer, "the Chevalier de Carignan wishes to become a soldier like his father. He has learned to handle arms and to ride with me. He requests command of a company." But the King remained motionless, looking over the head of the trembling young man as if he did not exist. Prince Conti did not insist and led his companion out of the hall without the King deigning to speak to him.

The Chevalier de Carignan, who was thus affronted, was named Eugene. He had been destined for the priesthood because of his feeble health. He was the fifth son of the Count of Soissons, Prince of Savoy, Colonel-General of the Swiss and the Grisons. His mother, Olympe Mancini, niece of Cardinal Mazarin, had been one of the King's friends. Eugene never forgot this humiliation. From this day he detested the King. He fought against France and forced the King to bend to his will.

His extraordinary career reads like a romance. He was a colonel of dragons at the age of twenty-one. His headlong courage, his supple mind, his clairvoyance which embraced the most complicated strategical situations with a glance, quickly gave him a surprising authority in the high spheres of the army. He was a major general at the age of twenty-five.

He fought against the French in Italy. In 1697, when he annihilated the Turks at Zenta, he was thirty-three years old and field marshal of the Holy Roman Empire. His growing fame disturbed Louis XIV, who offered him the baton of Marshal of France. But the little Prince of Savoy was proud; he refused it.

The War of the Succession in Spain furnished him new chances for glory. He defeated the best generals of Louis XIV. In 1708, Louis was at the last extremity, France exhausted and famine menacing. Eugene had no hate left for the old man of Versailles. He had become his equal. He knew that the King no longer scorned him. Louis XIV died. The peace of Rastatt ended the position of France as the greatest nation of Europe. The unpleasant looking youth that the Roi Soleil had scorned, had overcome, almost by himself, the most powerful rule of the time.

Is there a lesson in this for that peculiar type of army officer who is agreeable only to his seniors and irascible and overbearing to his juniors?

(3) LE JALONNEMENT, SIMPLE PROBLÈME DE LIAISON. [Staking out front lines. A problem in liaison.] Captain Schlegel

An article on liaison between the infantry and the airplane. It deals principally with the measures to be taken to mark the location of front line troops by location panels, either at prearranged times, or at the call of the airplane. The author recommends the use of a large number of small panels, about 16 inches by 22 inches, for this purpose.

(4) NOTES SUR L'ORGANISATION DES COMPAGNIES MITR. DE BATAILLON. [Notes on the organization of battalion machine gun companies.] Captain Zweifel

This problem is examined primarily from the point of view of the Swiss army. The French principally use air-cooled machine guns which have to be in groups of two for continuous fire. In the French service these are commanded by a corporal and the section of four machine guns by a sergeant. This is practicable for the French because they have such a large number of permanent well-trained noncommissioned officers.

The German army uses water-cooled guns, theoretically capable of continuous fire. Their sections are composed of three machine guns and are commanded by an officer.

Because of the poor state of training of the Swiss soldiers, who receive military instruction only thirteen days a year, it is necessary for Switzerland to adopt the German method. It is even impracticable to have an

officer in command of a four-gun section with groups of two guns commanded by noncommissioned officers. To get the fire support of which the machine guns are capable it is necessary to have an officer in command of each three.

The organization of a battalion machine-gun company should, therefore, include: four sections of three guns, each commanded by an officer; one antiaircraft machine-gun section of four guns commanded by an officer; and a company headquarters and supply section.

July 1936

(5) L'INSTRUCTION DU TIR DANS L'INFANTERIE FRANCAISE IL Y A UN DEMI-SIÈCLE. [Fire instruction in the French infantry half a century ago.] Lieut.Colonel Mayer

(6) LES AÉRONAUTIQUES MILITAIRES DE NOS VOISINS. [The air forces of our neighbors.] Captain Schlegel

FRANCE.—By the decree of 1 April 1933, French military aviation was transformed into an independent "air army." Since that time it has been rebuilt to a remarkable extent. It was not long ago that French aviation was simply considered from the point of view of quantity. Today it adds quality and efficiency to its large numbers.

The mission of the Air Army is defined by the decree of April 1933, as: "To wage the aerial battle, that is to say, to attack the enemy aviation on its bases, on doubtful terrain and, in general, to act against all objectives whose destruction could have an influence on the potential of this aviation (aerial factories, gasoline depots, munitions, etc.). To participate in terrestrial and naval operations. To assure the aerial defense of the country."

France and the colonies are organized into five aerial regions. The general commanding the region is at the same time territorial commander and troop commander. The air organizations assigned to a region are divided into brigades, half-brigades, squadrons, groups and escadrilles. The active aerial forces, including naval aviation, comprise about 170 escadrilles with about 1,800 planes of the first line.

In 1933 the French air force was composed of about 4,000 planes which were mostly of poor performance. The pursuit did not exceed a speed of 160 miles per hour and bombardment and observation 140 miles per hour. Among other realizations of the new construction program is a multiplace plane intended for all purposes: bombardment, observation and combat ("BCR"). Its primary use is observation but it is constructed to reinforce bombardment units in case of need. The performance required was:

Speed: 186 to 217 miles per hour

Bomb load: 660 pounds

Distance of flight: 806 miles.

The following table gives data on some of the types now in use:
RECAPITULATION OF SOME TYPES

		Power	Speed	Armament		
				MGs	Can- non	Bombs
Dewoitine 500 ..	Monoplace pursuit	690	230	2	.....	Light
Dewoitine 510 ..	Monoplace pursuit	860	248	2	1	Light
Loire 46.....	Monoplace pursuit	900	248	2	2	Light
Mureaux 117	Obsn	860	211	2	1	300 kg
Potez 540.....	BCR	2x860	205	3	.....	900 kg
Amiot 143.....	BCR	2x800	192	4	.....	1200-1600 kg
Bloch 210.....	BCR	2x800	202	3	.....	2000 kg
Farman 222.....	Heavy bomb	4x790	202	3	.....	2500-4000 kg

The 1934 program anticipates single seaters whose speed will exceed 280 miles per hour and high speed bombardment which will carry 1,400 kg. of bombs at a speed of 248 miles per hour. These planes are now being built; the first models have had their trial flights.

Armament.—Performance alone does not suffice; it is necessary that armament should progress with the improvement of the planes. A big step was taken in this direction by the introduction of Oerlikon 20-mm. cannon. The Dewoitine 510 pursuit is already equipped with this automatic cannon. The new multiplace of the 1934 program will be partly supplied with these cannon in sliding turrets. The use of an explosive projectile against planes will give an immensely increased efficacy of aerial fire.

ITALY.—The Italian aviation was organized as an independent air army on 4 March 1925. It is divided into three distinct groups:

- (a) The Air Army.
- (b) Aviation for military cooperation.
- (c) Aviation for naval cooperation.

The air army is composed almost exclusively of pursuit and bombardment with six squadrons of observation aviation to enable it to make its own reconnaissances. Its effectives are about:

Bombardment.....	260 planes
Pursuit.....	465 planes
Attack.....	60 planes
Observation.....	55 planes

Total: 80 squadrons.....840 planes

The aviation of military cooperation placed at the disposal of the Chief of Staff of the army consists of about 22 squadrons of about 200 observation planes. The aviation for naval cooperation consists of 10 squadrons of 90 observation planes.

Active and reserve, the Italian air forces comprise about 2,000 planes.

The new planes in service at the present time are of the following types:

Type	Use	Power	Speed	Armament
Fiat CR 30.....	Pursuit	600	227	2 MGs
Fiat CR 32.....	Pursuit	800	236	2 MGs
Fiat CR 33.....	Pursuit	700	248	2 MGs
Romeo 37.....	Obsn	800	202	3 MGs
Savoia S 79.....	Bomb	3x610	236	3 MGs 2000 kg bombs
Savoia S 81.....	Bomb	3x700	211	3 MGs 2000 kg bombs

GERMANY.—The German Ministry of the Air was created 5 May 1933, with General Herman Goering at its head. He is at the same time the actual commander of the German aerial forces.

Germany is divided into six aerial regions. The generals commanding the regions report directly to the Minister of Air. The Air Army includes:

- (a) Military aviation, with the information service.
- (b) Antiaircraft artillery.
- (c) Aeronautical liaison and signal service (Luftnachrichtentruppe).

Fantastic figures have been given about the aerial strength of Germany. Their actual force does not exceed 1,000 first line planes. However, this does not tell the whole story. What counts is the accelerating speed of German aerial rearmament. Germany will unquestionably reach parity with France in the near future.

BELGIUM.—Belgium has an air force of about 300 modern planes of high performance. The Air Force is separately organized and includes the Ground Defense Against Airplanes (DTCA). Lighter than air (balloons, etc.) has been abandoned.

(7) LA PRESSE ET LA DÉFENSE NATIONALE. [The press and national defense.] Captain Paquier

Some examples of the trouble caused in the past by freedom of the press in war. Napoleon limited the right of the press to publish news of military movements, but until 1870, when the Germans did so methodically, the necessity had not been recognized and press censorship, now so general, was practically unknown.

August 1936

(8) TROUPES DU GÉNIE. [Engineer troops.] Colonel Lecomte

A discussion of the need for more engineer troops in the Swiss military organization and of the assignments of engineer units to the various echelons.

(9) LE TIR À LA MITRAILLEUSE CONTRE AVIONS. [Machine gun fire against airplanes.] Captain Daniel

A technical discussion of small arms fire against airplanes. The author recommends the use of the forward area sight as preferable to tracers. The sight should be used by successively sighting on the plane with the outer circle and holding while the plane reaches the inner circle. The sight he describes is so constructed that at some point of the passage of the plane through the sight area it will pass through the line of fire of the gun. The effect is that each gun places a barrage of fire at a point in the path which the sight predicts the plane will follow. When the plane has passed through the barrage the gun is resighted. This article is of interest to all officers who are investigating small arms fire against airplanes.

(10) NOS RÉCENTES MANŒUVRES AÉRIENNES. [Our recent air maneuvers.] Captain Schlegel

Notes on the Swiss air maneuvers held from 15 to 17 June 1936. The problems consisted of attacks by two groups of bombardment on vital centers and defense by a regiment of pursuit aviation aided by an extensive ground observation service. In spite of cloud masses at 6,000 to 8,000 feet hiding the approach of the bombers, most of the raids were intercepted either going or returning. The ground observation service proved of great value and enabled the defenders to track and predict the routes followed by the attackers. The use of radio by the pursuit, both for communication with the ground service and in the air, proved of great value.

RIVISTA DI ARTIGLIERIA E GENIO (Italy)

By Major F. During, Infantry

June 1936

- (1) LA CONTROBATTERIA NELLA GUERRA DI MOVIMENTO. [Counterbattery in a war of movement.] Colonel Marras
- (2) I TUBE ELETTRONICI MULTIGRIGLIE ED IL LORO EVENTUALE IMPIEGO NELLE STAZIONI RADIO PER USO CAMPALE. [Radio work in campaign.] Colonel Gatta
- (3) QUESTIONI D'ADDESTRAMENTO E D'IMPIEGO DELL'ARTIGLIERIA ALPINA. [Training and employment of mountain artillery.] Lieut. Colonel Molinari
- (4) SUL CONTROLLO IN CANTIERE DEI LAVORI IN CONGLOMERATO CEMENTIZIO SEMPLICE OD ARMATO. [Principles of concrete construction.] Lieut. Colonel Bello, and Lieutenant Betocchi
- (5) LE BATTERIE DI ACCOMPAGNAMENTO DEI REGGIMENTI DI FANTERIA. [Infantry accompanying batteries.] General Fontana

July-August 1936

- (6) ARTIGLIERIA ANNO XIV. [Modern artillery.] General Balocco
An article pertaining to the organization and employment of modern artillery.
- (7) NOTE SULLA ORGANIZZAZIONE DEI MODERNI MATERIALI D'ARTIGLIERIA CONTRAEREL. [Organization of antiaircraft artillery.] By S.T.A.M.
- (8) DISTRUZIONI. IMPIEGO DELLE UNITÀ DEL GENIO. [Demolitions.] Colonel Robbiano
- (9) STUDIO, IN GENERALE, DEL RIFORNIMENTO MUNIZIONI IN MONTAGNA. [Ammunition supply in mountainous country.] Major Micheletti
- (10) L'IMPIEGO DELL'ARTIGLIERIA NEL BASSOPIANO SOMALO E SULL'ALTIPIANO ETIOPICO. [Employment of artillery in the Somaliland plains and Abyssinian highlands.] Major Petroni
- (11) L'IMPIEGO DEL CONGLOMERATO CEMENTIZIO DURANTE I PERIODI FREDDI. [Principles of concrete construction in freezing weather.] Lieutenant Betocchi

ROYAL AIR FORCE QUARTERLY (Great Britain)

January 1937

- (1) VIEWS ON AIR DEFENCE. By the Authors of "Air Strategy"
- (2) THE AIRCRAFT INDUSTRY AND THE R.A.F. Wing-Commander Howard-Williams
- (3) ROYAL AIR FORCE MOBILITY—A REPLY. Flight-Lieutenant Blackden
- (4) THE KURDS IN IRAQ
- (5) THE MUSE OF HISTORY. Major Pemberton
- (6) CANADA AND WAR IN THE AIR. Wing-Commander Tackaberry
- (7) DISARMAMENT AND THE PREVENTION OF WAR. Flight-Lieutenant Rugg

ROYAL ARMY SERVICE CORPS QUARTERLY (Great Britain)

November 1936

- (1) THE DISTRIBUTION OF REINFORCEMENT DRIVERS IN A MAJOR CAMPAIGN
- (2) THE DOUBLE ECHELONMENT SYSTEM OF SUPPLY IN 1914
- (3) THE REPLENISHMENT OF AMMUNITION IN THE LIGHT OF RECENT DEVELOPMENTS
- (4) THE ROYAL ARMY SERVICE CORPS TRAINING CENTRE AND ITS FUNCTIONS
- (5) NOTES ON THE NEW 1935 F.S.R., VOLS. II AND III

(6) PROBLEMS IN TRAINING THE DIVISIONAL R.A.S.C. OF THE TERRITORIAL ARMY

(7) THE CARRIAGE OF BAGGAGE ON ACTIVE SERVICE

ROYAL ENGINEERS JOURNAL (Great Britain)

December 1936

(1) RECENT DEVELOPMENTS IN VISUAL PLOTTING. Major Lithgow

(2) HOUSE DEMOLITIONS IN PALESTINE. Captain Dove

(3) A CROSSING OF THE INDUS. Lieutenant Perceval

(4) THE FUTURE OF SEARCHLIGHTS. Major Cameron

(5) THE NORTHERN BRIGADE: KING'S AFRICAN RIFLES. Captain Rolleston

(6) MOUNTED SAPPERS IN THE NEAR EAST, 1916-19. Lieut. Colonel Fowle

(7) THE CARRIAGE OF PONTON EQUIPMENT BY CIVILIAN TRANSPORT. By "J.A.C."

(8) ENGINEERS IN ARMoured FORMATIONS

(9) ACROSS AMERICA BY CAR. Captain Deane

(10) USE OF DYNAMITE IN DEEPENING A STREAM

(11) THE LAFIA-CHAD ROUTE SELECTION, 1928-1929. Captain Bagnall-Wild

(12) A GRID SYSTEM FOR ORDNANCE SURVEY MAPS. Brevet Major Hotine

(13) TRAVELS IN TSITSIHAR. Captain Davidson-Houston

SANCT CHRISTOPHORUS (Germany)

By Lieutenant Colonel S.J. Heidner, Infantry

July 1936

(1) PANZERKAMPFWAGEN-ANGRIFF IM UND MIT NEBEL. [The tank attack under cover of natural or artificial fog.] Major Volckheim

The author is convinced that the increased effectiveness of antitank weapons makes it necessary for attacking tanks to employ every means for diminishing their action. He considers that natural fog and artificial fog or smoke are significant means to this end and discusses their advantages and disadvantages.

Natural fog played an important role in tank attacks during the World War. Most of the German tank attacks in 1918 were launched at daybreak and in a fog. The sudden appearance of the tanks out of the fog frequently so surprised the enemy that he made no appreciable resistance. The experiences of the German tank troops in the World War led to the conclusion that natural fog greatly aided a tank attack.

A light fog which permits vision to about 1,000 yards greatly assists the attacking tanks. It permits their unseen approach to within a short distance of the enemy and thus favors surprise and prevents the enemy from using his antitank weapons at their most favorable ranges. At the same time such a fog does not interfere with the driving of a tank, does not prevent visual liaison within the tank unit, nor does it prevent the use of the weapons of the tank at the short ranges at which they are most effective. On the other hand, a heavy fog makes it difficult for tanks to keep their bearings and prevents visual contact with each other. It reduces the attacking speed, may prevent the timely discovery of serious obstacles, and reduces the effectiveness of the weapons of the tanks.

The time, the density and the extent of natural fogs, of course, cannot be controlled. Artificial fog or smoke, however, can be produced about when, how, and where wanted. It has the disadvantage that it attracts the attention of the enemy. Hence it should not be put down until just before an attack is launched. Furthermore, it should be used on a broad front so as to keep the enemy in ignorance of the exact place where the

attack is to be launched. Smoke may also be used on a front not to be attacked in order to deceive the enemy.

Among the means for putting down smoke screens are smoke candles, artillery or trench mortar smoke shells, airplanes, and special smoke-laying tanks. All these methods have been tried out by different countries with varying results. No matter how the smoke is produced, the purpose is always the same, that is, it should screen the attacking tanks from hostile view and therefore from effective hostile fire while at the same time it should not blind the attacking tanks nor give away the tank attack prematurely.

It will naturally be desirable to use smoke during all the phases of the battle and not only at the start. Due to the speed with which a tank attack will move forward it will be difficult for artillery and trench mortars to accomplish this. It would seem that airplanes and smoke-laying tanks should be the most practical means for laying smoke screens as the attack progresses.

Major Volkheim concludes that the proper employment of smoke should be a very valuable aid to attacking tanks in spite of certain disadvantages attached to its use.

(2) KAMPF GEGEN PANZERWAGEN. [Defense against tanks.] Major Zimmermann

This article by Major Zimmermann, who commands a tank battalion, is a criticism of the book with the above title by Major von Schell. The criticism concerns itself principally with the employment of the regimental antitank companies and the division antitank battalion in different types of action.

The two authors agree as to the dispositions of these units on the march. They believe that the platoons of the regimental antitank companies should be distributed in the marching infantry columns, with particular attention to the points of the advance guards, while the division antitank battalion should be held together and march with the division motor column.

During the development, Major Zimmermann believes that it is important to protect the leading battalions. He therefore thinks that a platoon of the regimental antitank company should be attached to each leading battalion. The book on the other hand recommends holding the regimental antitank companies together.

On the defensive, the book recommends emplacing some of the antitank guns in the outpost zone and emplacing the division antitank battalion in position close behind the front line. Major Zimmermann believes the antitank guns placed in the outpost zone will be wasted and he believes that the hostile artillery preparation which will precede a tank attack will destroy a large part of the division antitank guns. Therefore, he believes that the division antitank guns should not be placed in position, but that this battalion should be held intact ready to meet a tank attack from whatever direction it may come.

In the delaying action the book advocates reinforcing the infantry regiments with part of the division antitank battalion. Major Zimmermann believes this to be an unnecessary dispersion of defensive means. He believes that the division antitank battalion should be held together under division control.

(3) NEUES VON DER HEERESMOTORISIERUNG IN FREMDEN HEEREN. [News about motorization in foreign armies.]

This article consists of a series of press reviews from foreign periodicals. The following are summaries of those interesting articles not reviewed elsewhere in this Quarterly.

According to "Krassnaja Swjesda" the British have been using in the Libyan Desert a Ford vehicle which is a combination between a tank and a truck. It carries one machine gun mounted to fire forward. Its cross-country ability, especially in sand, is increased by the use of giant rubber tires.

"Krassnaja Swjesda" reports that Sweden is manufacturing an armored motorcycle with side-car. It is armed with a machine gun which can fire forward or to the rear and which can also be used for antitank defense.

Great Britain is organizing machine-gun battalions constituted as follows:

- 1 staff company
- 2 machine-gun companies with 20-mm. machine guns
- 1 antitank company with 12 guns
- 1 reconnaissance company equipped with light, fast, armored cars.

The battalion is completely motorized and the antitank guns and machine-gun carriers are armored.

In "Krassnaja Swjesda" there is described a semi-tread trailer, used by the Italians. The tread, which goes over the rear wheels of the trailer, is very broad and particularly useful for sandy soil. On hard roads the treads can be easily removed and the vehicle then rolls on its wheels.

"Krassnaja Swjesda" reports on two new military tractors produced by the firm Landsverk of Sweden. "Landsverk 131" has a weight of $4\frac{1}{2}$ tons, carries a 60 horse-power motor, and has a speed of 13 miles per hour. The tractor itself can carry a load of $1\frac{1}{2}$ tons or 10 men. "Landsverk 132" has a weight of $5\frac{1}{2}$ tons, a motor of 90 horse-power, and has a speed of 15 miles per hour. It can carry two tons.

The Italians in Abyssinia have been using a special mountain truck which has a great cross-country ability. This is attained by having four-wheel drive and by having wheels of exceptionally large diameter. Lugs can be placed on the wheels to increase their traction on soft ground. These trucks can climb a slope up to 40° , a feat previously performed only by vehicles equipped with caterpillar treads. These vehicles have a 21 horse-power, air-cooled motor, and have a speed of 15 miles per hour. They carry a useful load of eight-tenths of a ton.

Major Daniker in the "Neuen Zuricker Zeitung" writes an article on the subject of motorization. He invites attention to the fact that motorization has been introduced into armies to increase the speed with which troops can be moved and with which supplies may be brought up. Mechanization, on the other hand, has for its purpose the increasing of mobility when confronted by hostile resistance. This author is of the opinion that mechanization will bring out larger calibers and greater muzzle velocity in antitank weapons, which will in turn defeat the purpose of mechanization. Therefore, he questions whether motorization in armies is not the greatest advance of this age rather than mechanization.

According to various press reports, motorization in the French army has been carried out as follows: Seven infantry divisions are partially motorized. These have the staff, the signal and reconnaissance troops, and the trains, completely motorized. The communications platoon of the infantry and artillery battalions are also motorized. The infantry is to be transported in trucks in which only a part of the animals will be moved. There are four completely motorized divisions. These divisions have sufficient organic trucks to move all their personnel. For this purpose, trucks of from two-ton to five-ton capacity are used, arranged for carrying from twenty to forty men. It is planned to ultimately equip these divisions with cross-country trucks. There is one light motorized division. This division has a regiment of armored cars and a brigade of tanks. It also has an infantry unit of several battalions mounted on cross-country vehicles, and the necessary artillery, engineers, signal troops, and supply agencies. France also has cavalry divisions which are partly motorized. They have a horse brigade and a brigade of "Dragons portées," which consists of riflemen carried on cross-country vehicles. The artillery, engineers, signal troops and trains of these divisions are also motorized.

August 1936

(4) GLIEDERUNG UND VERWENDUNG MOTORISierter VERBÄNDE. [Organization and employment of motorized units.] (See abstract, page 49)

(5) DIE HAUPTTEIGENSCHAFTEN EINES PANZERKAMPFWAGENS UND IHRE AUSNUTZUNG IM KAMPF. [The essential characteristics of tanks and their employment in battle.]

The tank exists because, by the means of its motor and armor, it can rapidly bring its crew with their weapons into contact with the enemy. To accomplish this the tank must have these essential characteristics: Mobility, fire-power, armor.

These characteristics cannot be combined in any ideal manner. Every tank must be a compromise. Heavy armament requires space, and, like heavy armor, this means increased weight. But weight decreases the tank's mobility, and decreased mobility increases its vulnerability, which therefore has the same effect as reducing the armor protection. This vicious circle necessarily leads to the development of different types of tanks in which one or more of the essential characteristics are emphasized according to the purpose of the type.

To get the maximum results from the tank in battle, its special characteristics must be fully utilized. The mobility of the tank permits surprise and the rapid concentrations of tank masses. The mobility can be increased by carefully selecting terrain most favorable for tank action. This requires reconnaissance and the study of maps and airplane photographs. The obstacles within the radius of action must be carefully studied and preparatory measures adopted to overcome them when necessary.

To fully utilize the mobility and fire power of the tank in battle, care must be taken not to wear out the matériel nor to exhaust the crews before the battle. To avoid wear on the trucks and motors, use must be made of the railroads and of special trucks for transporting tanks over great distances.

The armor of the tank should bring the crew safely into the battle, but it would be false to rely on its protection alone. Every offensive weapon brings out a means for defense; the tank has produced the antitank gun. Hence the mobility of the tank and such special combat measures as artillery fire and smoke must be used to augment the protection afforded by the armor.

The fire power of the tank is most effectively utilized when formations are adopted which permit the heavy massing of fires.

Finally, for the complete utilization of the essential characteristics of the tank, highly trained crews are indispensable.

(6) NOTWENDIGE FESTSTELLUNGEN ZUR PANZERABWEHR. [Essentials about antitank defense.] Captain v.Moltke. (See abstract, page 59)

September 1936

(7) MODERNSTES GERÄT BEI PANZER- UND MOTORISIERTEN VERBÄNDEN. [Latest equipment of mechanized and motorized units.]

This article consists of a series of reviews of articles in foreign periodicals. The following are summaries of some of the interesting items not reviewed elsewhere in the Quarterly.

According to "Krassnaja Swjesda" the Japanese Model 93 tank weighs 7 tons, has an 85 horse-power air-cooled motor, a speed of 28 miles per hour, and is armed with either two light machine guns or a light and a heavy machine gun. It is 4.48 meters long, 1.8 meters wide, and 1.83 meters high. It can cross a ditch 1.8 meters wide, pass over an obstacle .8 meter high, and climb a slope of 42°. The crew consists of three men. Experiments are being made with a view towards converting this tank into an amphibious type.

"Krassnaja Swjesda" has an account of a maneuver in which an attack of infantry supported by tanks was launched under cover of smoke. The maneuver took place on the open steppes where no cover was available. The infantry put down a smoke screen with smoke candles. Under cover of this screen the tanks approached the enemy position, then, passing through the screen, the tanks fell upon the defending lines and opened lanes for the infantry which followed.

In the Russian tank school, officer candidates are trained in all phases of mechanized warfare. Particular stress is given to practical training in driving tanks over every type of obstacle, especially watercourses.

The restricted vision from a tank has always been a handicap to the driver and gunners. Now this is being remedied everywhere by enlarging the observation slits, and protecting them with bullet-proof glass which can be easily changed when it loses its transparency by being hit.

"*Krassnaja Swjesda*" reports that there has been introduced in the Venezuelan army a scout car of the "turtle back" type. The sloping armor is intended to prevent normal impact by a striking projectile. The vehicle is a six-wheel type. Chains can be placed around the rear pair of wheels, making the car half-track. The armament consists of a 20-mm. automatic gun with 90° elevation, thus making it effective against aircraft.

The latest type of scout car introduced in the Czechoslovakian army is the "*Skoda Pa 4*." This car weighs 8.7 tons, has a 100 horse-power motor, and a speed of 45 miles per hour. Its armament consists of a 20-mm. gun forward in the body, and two machine guns in the turret. It carries a crew of five.

According to "*Krassnaja Swjesda*," "*Morris Vickers*" in England is manufacturing a scout car for sale to foreign armies. This car weighs 4½ tons, has a 50 horse-power motor, and a speed of 64 kilometers per hour. It has six wheels and can be converted into a half-track vehicle. The crew consists of three, and the armament of one machine gun is in a turret. The car has a radius of action of about 156 miles.

"*Krassnaja Swjesda*" reports that in the reorganization of the Austrian army which is following the return of universal military service, there is to be organized a mechanized division. This division will consist of four "*Jäger*" battalions transported on cross-country vehicles, two cavalry regiments, artillery, and other units.

Press reports indicate that the Polish army has been motorized to the following extent: each of the 10 army corps has a truck battalion for supply; there are eight tank battalions; there are two detachments of scout cars; and one artillery regiment is motorized. Each of the 90 infantry regiments is ultimately to have a tank company. The lack of manufacturing facilities and of improved roads in Poland is responsible for the limited development of motorization in her army.

The following are some of the recent developments in the French army. A labor detachment has been organized for each tank regiment. All infantry and cavalry units are equipped with a 25-mm. Hotchkiss anti-tank gun. The 3d, 12th and 15th Infantry Divisions are fully motorized, and it is also intended to motorize the 1st Division. A number of other divisions are partly motorized. The artillery is about half motorized. An armored scout-car detachment has been assigned to the 1st Cavalry Division. The 4th Cavalry Division is fully motorized, and is designated as a light mechanized division. Large numbers of the heavy but fast Model D tank have been introduced into the tank units. In North Africa a new tank battalion has been organized. Tank obstacles are being constructed along the line of fortifications on the northeastern frontier. During the maneuvers in Champagne a motorized army corps was constituted.

(8) ABWEHR VON PANZERKAMPFWAGEN-ANGRIFFEN IM UND MIT NEBEL. [Defense against tank attacks made under cover of fog or smoke.]

The author of this article believes that defense against tank attacks launched under cover of a natural fog or an artificial smoke screen is so serious a question that it deserves thorough consideration. He discusses the problem in its application to different forms of combat.

On the defensive, where there is sufficient time to coordinate the action of all means for antitank defense, the problem is most easily solved. Here it should be possible to break up a surprise tank attack even if it approaches under the cover of smoke or fog. The weight of the antitank defense will not fall upon the antitank units alone, but particularly also upon the engineers. Tank obstacles will be especially effective in a fog, since the tanks, with their limited vision, will have difficulty in discovering the obstacles in time. Antitank guns in firing position or in a position of readiness, should have available prepared obstacles for their protection,

for there will not be available time to construct obstacles. Engineers will be occupied especially for the construction of obstacles at those places where antitank guns are not to be employed. Antitank units should always make the fullest possible use of natural tank obstacles such as the edge of woods, villages, or steep slopes. Since artificial smoke can not be kept at a heavy uniform density over the whole defensive position, it becomes important to have the antitank guns distributed in depth so that some of them will have a chance to see and fire upon the attacking tanks. The author comes to two conclusions concerning the defense against a tank attack launched under cover of fog or smoke:

- (a) The emplacements of antitank guns, especially those protecting the infantry, should be protected by artificial obstacles when they cannot be protected by natural ones, otherwise they will be in danger of being overrun.
- (b) The division antitank battalion should utilize natural obstacles for the protection of its emplacements, and the emplacements should be echeloned in depth and selected with a view to obtaining flanking fire against attacking tanks.

The problem of protecting attacking troops from a counterattack by tanks launched from cover of fog or smoke is a much more serious one. During the attack there will not be time to construct artificial obstacles and it will not always be possible to utilize natural ones. It may be useful for every antitank gun to carry a small number of mines which can be quickly placed in a semicircle facing the threatened direction, for the protection of the gun. A single shot antitank gun is not effective against tanks charging out of a fog; such a situation requires an automatic weapon capable of meeting the tanks with a hail of bullets. The author believes that the antitank gun should be drawn by a cross-country tractor or mounted on a self-propelled vehicle, that it should be in a firing position even on the march, that it should have a rapid rate of fire, and that it should be provided with a small number of antitank mines.

The problem of antitank defense in the retirement or in the pursuit will be similar to that in the attack because there will not be time enough to organize a coordinated defense.

In the delaying action antitank defense will be similar to that in the defensive but there will be new problems on account of the broad front to be covered. This necessitates the thin distribution of antitank guns and invites penetration by hostile mechanized forces. Hence it is particularly important that engineer units, motorized if possible, be employed to set out mine fields for the protection of the antitank guns. In certain cases, as for example along the main routes leading to the rear, it would seem proper to attach antitank units to the engineers.

The author does not intend to give the impression that tanks attacking from cover of fog or smoke are superior to any defense that can be established against them but he does wish to call attention to the seriousness of this problem and he hopes that efforts will be made to properly solve it.

(9) PANZERABWEHR. [Antitank defense.]

This article is a review of the book, "Antitank Defense," by First Lieutenant Walther Nehring. It contains the following chapters: General Considerations; Nature of the Tank; Nature of Antitank Defense; Active Means for Antitank Defense; Passive Means for Antitank Defense; Employment, Control and Training; Conclusions.

There is also an appendix dealing with historical examples and with some of the latest developments in mechanization in foreign armies.

The chapter on Active Means for Antitank Defense goes into great detail over the antitank gun. It has tables showing the armor-penetrating ability of different calibers at various angles of incidence. The role in antitank defense of machine guns, trench mortars, flame throwers, and hand grenades is discussed. The chapter also takes up the part that aviation must play in antitank defense.

In the chapter on Passive Means for Antitank Defense, the author discusses the influence of terrain, the necessity of using obstacles to canalize the tank attack, the use of antitank mines, and the influence of fog and darkness on attacking tanks.

The author believes that the antitank troops should be a corps d'élite. The greatest sacrifice will have to be demanded of them at times, and they will not have other troops near them to bolster their courage. He cites the case of a German Lieutenant at Cambrai who served a field piece by himself and disabled 17 British tanks. In order for the antitank defense to be successful, Lieutenant Nehring believes that there will be a continual race between tanks and antitank defense. Since, however, antitank defense does not give decisive results, the emphasis in this race should be placed on the tank rather than on the defense.

SIGNAL CORPS BULLETIN

November-December 1936

- (1) HAS THE ARMY TOO MUCH RADIO? Major General Allison
- (2) THE FIFTH CORPS AREA. Colonel Eastman
- (3) POST SIGNAL ACTIVITIES AT WRIGHT FIELD AND PATTERSON FIELD. Captain Lyman
- (4) SIGNAL CORPS R.O.T.C. IN THE FIFTH CORPS AREA. Captain Kidwell
- (5) C.C.C. COMMUNICATION FACILITIES AT FORT BENJAMIN HARRISON, IND. Captain Van Way
- (6) SIGNAL CORPS TRAINING IN C.M.T.C., FORT BENJAMIN HARRISON, IND. Captain Van Way
- (7) ADVANCED TRAINING FOR SIGNAL CORPS OFFICERS OF THE REGULAR ARMY AT OHIO STATE UNIVERSITY. Captain Everitt
- (8) SOME OBSERVATIONS ON THE FIFTH CORPS AREA METEOROLOGICAL SERVICE. Captain McNeal
- (9) THE ARMY AMATEUR RADIO SYSTEM, FIFTH CORPS AREA. Lieutenant Windom
- (10) TRAIN DISPATCHING. Captain Teague
- (11) SIGNAL COMMUNICATION, FIRST CAVALRY DIVISION, MANEUVERS, 1936. Captain Black
- (12) RADIO RECEPTION. Lieut.Colonel Colton
- (13) SOLUTION OF A PLAYFAIR CIPHER. Private Monge, Signal Corps

VETERINARY BULLETIN

(Supplement to "The Army Medical Bulletin")

January 1937

- (1) EQUINE ENCEPHALOMYELITIS IN PANAMA. Lieut.Colonel Kelser
- (2) A BRIEF SKETCH OF THE VETERINARY SERVICE IN THE CHILEAN ARMY. Captain McNellis
- (3) POISONOUS PLANTS OF HAWAII. Captain Hodgson
- (4) SKELETAL DISEASE OF THE HORSE. Lieut.Colonel Campbell

WISSEN UND WEHR (Germany)

By Major G.J. Braun, Infantry

July 1936

- (1) DIE GEOGRAPHISCHEN GEGEBENHEITEN DER ÖLVERSORGUNG DER SEEMÄCHTE ENGLAND, FRANKREICH UND ITALIEN UND DEREN AUSWIRKUNGEN AUF DIE MASZNAHMEN DER LANDESVERTEIDIGUNG. [The geographic potentialities in oil supply of the sea powers: England, France and Italy.] Field Marshal Schafer

This article stresses the military requirements, source of supply and lanes of transportation of oil to the three principal European seapowers: England, France and Italy. The author shows that prior to the World War coal was the determining factor of power on land and sea in Europe. Even during the World War, the coal supply was an important factor

although oil became a deciding factor according to the author. The entrance of the United States in the war assured the supply of this commodity so sorely needed for transport service. France alone consumed 1,000 tons per day during normal warfare and 12,000 tons per day when a major offensive was in progress. Since the war, most all naval and commercial seacraft have been changed to oil burners and the great increase of aviation has also augmented the oil requirement of these nations.

By use of maps the author shows the location of the principal oil sources from which the three above mentioned powers derive their supply. None of these countries possess oil sources within their own boundaries and all are wholly dependent on sources elsewhere. By other maps the author shows the sea lanes used to transport this oil supply. France and England secure part of their supply by the Atlantic lanes, Italy receives most of her supply through the Mediterranean lanes. The other two powers likewise get much of their oil by the Mediterranean route. All nations which do not produce their own oil supply must provide extensive storage facilities for these necessary war reserves for an eventual war. Steps for the manufacture of synthetic gasoline must be taken by each country as a precaution against an oil blockade.

In conclusion, the author goes to some length to discuss the possibilities of Italian success in the event of a war with England or France. He emphasizes the strategic position of Italy in the Mediterranean Sea lane and the short distances to the important British and French colonial centers. He describes the numerous island submarine and air bases of the Italians which extend from Sicily to Libya and would become an important factor in the event of a war with these nations.

(2) PETERWARDEIN UND BELGRAD. [Peterwardein and Belgrade.] Marquardt

An excellent account of the campaigns of Prince Eugene of Austria against the Turks in the battles of Peterwardein and Belgrade during the fall of 1716 and spring of 1717, in which he defeated numerically superior forces. The author describes the remarkable leadership of Prince Eugene in each of these campaigns which required courage, initiative, decision and careful planning. In these two battles he established Austria as a power in southeastern Europe. Unfortunately the fruits of his victories were lost by the false influence of the Spaniards in the court of the Austrian Emperor which resulted in the shifting of the armies of the Prince to the Italian front.

(3) DIE VERSORGUNG DER FERNÖSTLICHEN SOWJETARMEE. [The supply of the Far Eastern Soviet Army.] Haudan (See abstract, page 86)

August 1936

(4) FRIEDRICH DER GROSZE UND WINTERFELDT. [Frederick the Great and Winterfeldt.] Lieut.Colonel Foerster

(5) FRIEDRICH DER GROSZE IM WANDEL DER KRIEGSGESCHICHTLICHEN ÜBERLIEFERUNG. [Frederick the Great as represented in the changes of military history.] Kessel

(6) FRIEDRICH DER GROSZE UND FOLARD. [Frederick the Great and Folard.] Linnebach

September 1936

(7) DIE EROBERUNG OFENS. [The conquest of Ofens.] Oestreich
(8) KRIEGFÜHRUNG IN DER WÜSTE. [Desert warfare.] General v.Kressenstein

An account of the German and Turkish fighting against the British in Palestine. The author discusses the desert warfare in and about Gaza, emphasizing the difficulties in supply for men and animals due to climatic and geographic difficulties as well as from enemy activities.

(9) WANDLUNG IN DER AMERIKANISCHEN NEUTRALITÄTSPOLITIK. [Change in American neutrality politics.] Rear Admiral v.Freyberg-Eisenberg

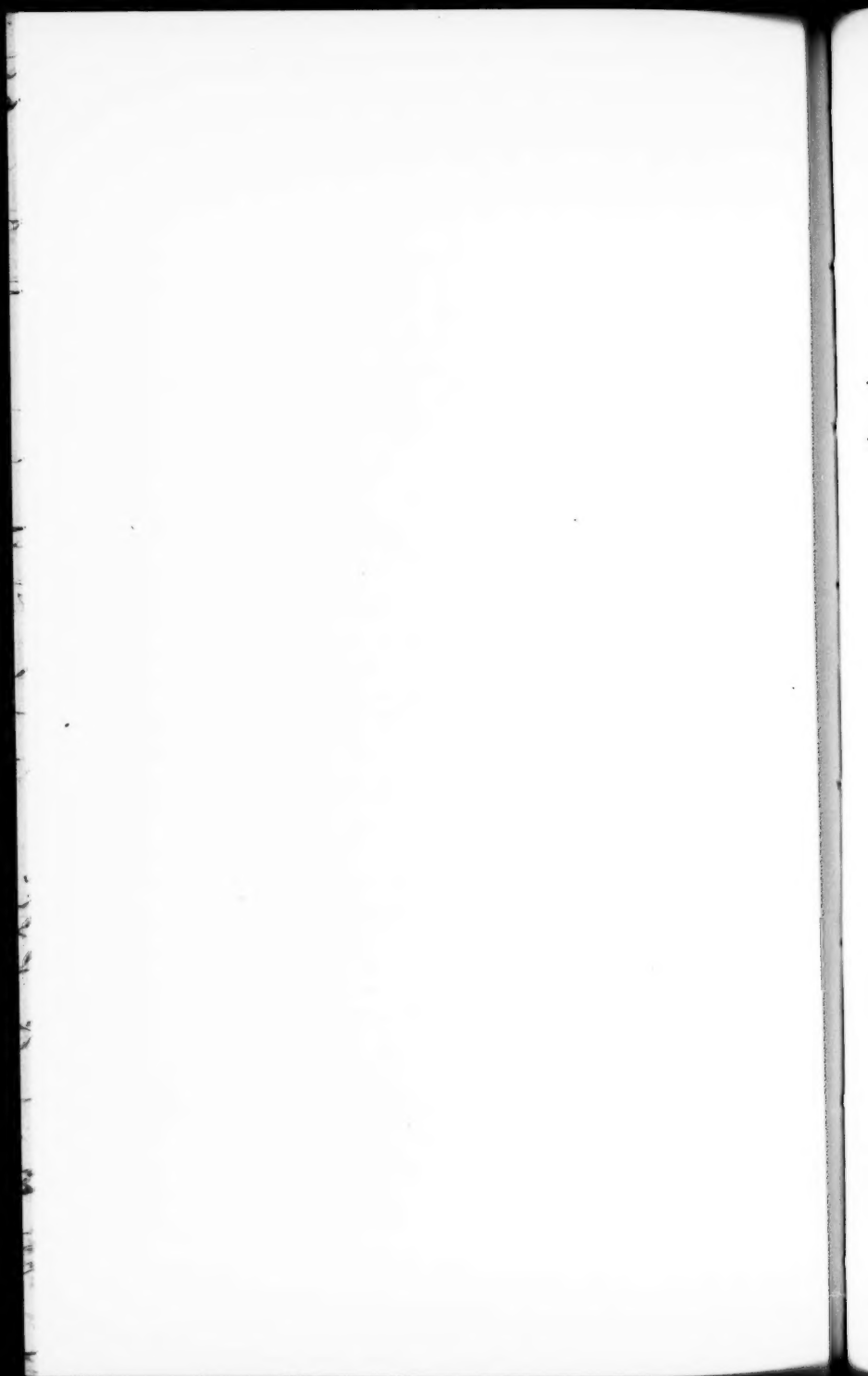
(10) CLAUSEWITZ' LEHRE VON ZWECK UND MITTEL. [Clausewitz' lessons on purpose and means.] Schering

A philosophical treatise on the conduct of war. The theme of Clausewitz' statements can be summarized in the formula, "tactics is the study of the use of armies in battle; strategy is the study of the use of battles to gain a purposeful end in war."

FOREIGN AFFAIRS

January 1937

- (1) GERMANY'S COLONIAL DEMANDS. Schacht
- (2) THE ARMIES OF EUROPE. Captain Liddell Hart
- (3) THE CHANGING BALANCE OF FORCES IN THE PACIFIC. Hu Shih
- (4) THE SPANISH REBELLION AND INTERNATIONAL LAW. Jessup
- (5) NEUTRALITY AND PEACE: THE VIEW OF A SMALL POWER. Koht
- (6) BRITISH EXPERIMENTS IN STATE INTERVENTION. Swing
- (7) PREREQUISITES TO MONETARY STABILIZATION. Sprague
- (8) CHARTING AMERICA'S NEWS OF THE WORLD WAR. Foster
- (9) THE AMERICAN AND BRITISH MUNITIONS INVESTIGATIONS. Scroggs
- (10) THE JEWS OF EASTERN EUROPE. Desider Kiss
- (11) WARS WITHIN WARS. Conger
- (12) HOW SANCTIONS FAILED. Bonn
- (13) THE FUTURE OF PORTUGAL'S COLONIES. Woolbert
- (14) JAPAN'S TRADE WITH THE NETHERLANDS INDIES. Le Clair
- (15) THE BALEARIC ISLANDS IN MEDITERRANEAN STRATEGY



Section 5

Academic Notes

THE COMMAND AND GENERAL STAFF SCHOOL

REPRINT OF CURRENT SCHOOL MATERIAL, WHICH AFFECTS
INSTRUCTIONAL PROCEDURE OR TACTICAL DOCTRINES

Instructional Organization

Commandant

BRIGADIER GENERAL C.M. BUNDEL, U.S. ARMY

Assistant Commandant

COLONEL J. A. McANDREW, Infantry

Naval Adviser

CAPTAIN A. STATON, U. S. Navy

Secretary

LIEUTENANT COLONEL F. GILBREATH, Cavalry

Directors

Regular Class.....LIEUT. COLONEL T. LAWRENCE, Inf.

Special Class and

Extension Courses.....LIEUT. COLONEL J. B. CRAWFORD, C.A.C.

Chiefs of Sections

- I. Offensive Operations.....LIEUT. COLONEL H. F. HAZLETT, Inf.
II. Intelligence and History...LIEUT. COLONEL K. G. EASTHAM, Cav.
III. Defensive Operations.....LIEUT. COLONEL H. L. C. JONES, F.A.
IV. Supply and Logistics.....LIEUT. COLONEL T. K. BROWN, Cav.
V. Miscellaneous.....LIEUT. COLONEL S. J. HEIDNER, Inf.

CONTENTS

	Page
General Principles of Reconnaissance and Security.....	156
Usage of the Term Position.....	179
Command and Staff Procedure.....	180
Antitank Defense.....	213
Supply, Evacuation, and Logistics.....	249
Combat Orders.....	267
List of Textbooks.....	280

GENERAL PRINCIPLES OF RECONNAISSANCE AND SECURITY*

Since the publication of the first installment of this series the War Department *Training Directive* for 1936-1937 has been issued, extracts of which follow:

* * * * *

"2. To obtain the full benefit of increased speed and mobility resulting from motorization, and to insure that cognizance is taken of the increased fire power and shock action resulting from improved weapons and mechanization, field exercises will emphasize the following trend in tactical doctrine:

a. Greater distances in operations of reconnaissance and security detachments.

b. More extended formations and wider envelopments in the attack.

c. Greater distribution in width and depth, and larger and more mobile reserves in the defense.

d. Provision for all around defense by larger units and for close defense by smaller units, including combat and service echelons in rear areas.

e. Provision for immediate protection against low-flying aircraft by all units, using available small arms and automatic weapons.

f. Use of camouflage and cover, night and cross country marches, distribution into smaller groups in combat and into appropriate formations on the march, to give greater protection against aerial attack and observation.

g. Use of warning and fragmentary orders to expedite execution of operations.

h. Full utilization of motor transportation in the movement of personnel and supplies, through coordinated pooling, control and operation on a multitrip basis.

i. Stricter motor traffic control."

* * * * *

1. GENERAL.—In the last article we discussed the general principles of reconnaissance and security which have been brought about by the increased radius of action of airplanes and motor vehicles, and the new conception of time and space as applied to organizations both in bivouac and on the march. It was pointed out that we must at all times have our commands within a *zone of security* which will guarantee not only the physical security of the troops against surprise attacks, but also the strategical and tactical security of the commander in accordance with the capabilities of the enemy.

*[NOTE.—This is the second of two articles covering the subject matter on the general principles of reconnaissance and security which has been presented this year by instructors of The Command and General Staff School. The first article appeared in the December 1936 (No. 63) issue of *The Command and General Staff School Quarterly*.—Editor.]

Information is the first line of security. In order to get this indispensable sheaf of information which is necessary for the commander constantly to adapt his own dispositions to the unexpected developments of the situation, and to form the basis for his scheme of maneuver, it may be necessary to pierce the veil with which the enemy will attempt to hide his dispositions. To do this the commander should have available to him units which can pass above the screen which the enemy will endeavor to place around his command; take advantage of any gaps in it and pass through it; or, break through it and reconnoiter what lies behind. That constitutes reconnaissance. On the other hand, the commander wants to prevent the enemy from doing the same thing to him and ascertaining his dispositions. Those measures constitute our own security.

To obtain absolute security it would theoretically be necessary to deny all observation to the enemy, both ground and air, and maintain an impregnable screen both around and above our command. This is not absolutely impossible at least for a short period of time; but it requires air superiority and an echelonment of security elements all around the command and pushed far enough forward so that the mass will always be sheltered from terrestrial observation.

The reconnaissance and security elements together will permit the continuity of movement of the mass for as long a time as possible in march columns, and then permit it to change from column formations to combat formations before it comes under the observed fire of an enemy.

2. STRENGTH, COMPOSITION, AND DISPOSITION OF SECURITY FORCES.—The strength, composition, and disposition of troops detailed for security duty will depend on the situation, the strength, composition, and proximity of the enemy, his capabilities, the size of the force to be protected, the location of other friendly troops, the weather and time of day, and the nature of the terrain.

No larger force than is necessary to accomplish the mission should be detailed to security duty. Units in special security detachments may at times have to be sacrificed to accomplish the mission.

3. LIAISON WITH SECURITY FORCES.—In the absence of instructions, security forces are responsible that they maintain liaison with the force that they are protecting and with other security elements, but the commander of a force covered is not relieved of responsibility for taking such steps as may be necessary to insure that this liaison is maintained. Air service working with security forces is responsible that liaison is established with these forces. The ground force must make prior arrangements as to identification panels.

Security on the March

4. GENERAL.—Troops march best on good roads and *in column*; they can fight in a coordinated effort only if they are able to *establish a front* and place their fire power on tactical localities. Therefore the whole art of march security consists of insuring the ability of the main body to pass from a march to a combat formation, or vice versa, without enemy interference, and to insure freedom of maneuver for the commander. The command is moved in a zone of security which on the march must include not only the entire depth of the march stage of the main body, but must extend through the entire possible radius of action from which the marching force can be menaced by the enemy. This will normally necessitate all-around security.

5. SECURITY WHEN BEYOND STRIKING DISTANCE OF THE ENEMY.—When our main body is beyond striking distance of the enemy main ground forces the necessity for advance, flank, and rear guards and other security detachments of a size capable of making combat is minor as compared with a thorough distant air and ground reconnaissance which will provide adequate warning of approaching aviation, mechanized or motorized elements and be able to delay or stop them.

6. SECURITY WHEN WITHIN STRIKING DISTANCE OF THE ENEMY'S MAIN GROUND FORCES.—When within striking distance of the enemy's main ground forces security is assured:

a. By marching in multiple columns and in flexible formations prepared to act promptly in any direction.

b. By avoiding roads that may be interdicted by hostile long-range artillery fire.

c. By the employment of advance, flank, and rear guards, reconnaissance detachments, and special security detachments.

d. By placing defended road blocks well out on the perimeter of the security zone and holding them until the main body passes (these may be a part of flank guards).

e. By the disposition of antimechanized and antitank weapons in such a manner as to command the approaches to the main body and repel any vehicles or detachments which may have eluded our own motor detachments.

7. GENERAL CONDUCT OF SECURITY DETACHMENTS.—The general action of the various security detachments should be such as to facilitate the combat dispositions and scheme of maneuver planned by the commander.

When the opposing forces draw within striking distance of each other, security detachments with special missions should be pushed sufficiently in advance of the main body to cover the next day's march—if practicable to natural terrain features. A given piece of terrain cannot be considered free of the enemy unless there are troops along the forward edge of it so disposed that hostile forces cannot filter through. Constant communication is maintained between the advanced detachments and the main body; and steps are taken to insure that whenever the main body is halted the advance elements are holding a terrain feature sufficiently advanced to permit freedom of maneuver for the main body.

If offensive action is contemplated it may be necessary to reinforce these detachments with additional troops detailed from the main body; or reconnaissance detachments may be sent up to relieve the cavalry in a particular area and allow it to proceed with other missions.

8. DIFFERENCES BETWEEN ADVANCE AND FLANK AND REAR GUARDS.—While all are security detachments, there is a distinction between the functions of the advance guards on the one hand and flank and rear guards on the other.

In the majority of cases the mission of the advance guard will be to enable the main body to make contact with the enemy under the most favorable circumstances and to construct a framework for the next action. Therefore the operation of an advance guard bears a distinct relationship to the future actions of the main body; and the maneuver of the advance guard will merge into and become a part of the operations of the main body. On the other hand, the mission of a flank or a rear guard, in the majority of cases, will be to permit the main body to avoid contact with the enemy in a threatened direction; and therefore, their operations will be largely independent and separate from the maneuvers of the main body. For these reasons flank and rear guards will engage in independent actions to a much greater extent than will the advance guards.

9. HALTS.—Halts must be made in areas suitable for security. Constant communication is maintained between the main body and its security detachments to insure that whenever the main body is halted the security elements are holding a terrain feature sufficiently advanced to permit freedom of maneuver of the main body and physical security to the command.

10. DURATION OF RESPONSIBILITY.—At the end of a march the troops which have acted as security forces during the march are responsible for the protection of the main body while halted or at rest unless and until other arrangements are made by the commander of the main body. Similarly, when the march is again started the outposts should not be withdrawn until the troops detailed on security missions are in position to assume the responsibility for the protection of the main body.

The Advance Guard

11. GENERAL.—An advance guard is a security detachment which precedes and covers the column on the march. When a force is advancing

towards or away from the enemy in one or more columns, and hostile interference is practicable, an advance guard will precede each column. This applies whether or not cavalry or other mobile troops are operating in front of the column or columns. The advance guard normally is composed of troops taken from the column it is protecting, and operates under orders of the column commander until a condition arises for coordination of their action.

12. **MISSION.**—The general mission of the advance guard is to assure the uninterrupted march of the main body. In situations involving action by the main body, it procures the necessary time and space for the maneuver and employment, in accordance with the orders of the column commander.

Its duties are:

a. To guard against surprise and to obtain information by reconnoitering to the front and flanks.

b. To push back small bodies of the enemy, and to prevent them from observing, firing upon, or delaying the main body.

c. To delay the enemy's advance in force long enough to permit the main body to prepare for action.

d. To initiate intensive reconnaissance when the enemy is encountered on the defensive.

e. To remove obstacles, to repair roads and bridges, and to facilitate in every way possible the uninterrupted march of the main body.

13. **STRENGTH AND COMPOSITION.**—*a. General.*—The strength and general composition of advance guards vary with the strength of the command, the mission, the situation, and the terrain. A large command requires relatively longer time to prepare for action than a small one; hence, the strength of its advance guard is correspondingly greater. An aggressive mission and the probability of strong hostile opposition require a relatively strong advance guard. Greater strength is required as the distance from the enemy decreases. An advance guard should be made sufficiently strong, initially, to accomplish its mission. The strength so employed should not exceed the requirements of the situation.

b. *Infantry and artillery.*—The proportion of the infantry of a column to be placed in the advance guard varies from a small fraction to approximately one-third of the infantry strength, depending on the mission, the size of the command, the proximity of the enemy, and the terrain. In small forces the advance guard may consist of infantry alone. When included in the column, light artillery should be attached to the advance guard or disposed for prompt support of that force. The amount of artillery to be attached, or to be disposed for prompt support should be sufficient to provide the necessary early support. In large columns, for example an infantry brigade, the advance guard should be a combat team composed largely of infantry and light artillery. Under exceptional conditions, particularly when long-range fire is especially advantageous, medium artillery may be attached.

c. *Cavalry.*—A small body of cavalry should be habitually attached for reconnaissance and for liaison.

d. *Engineers.*—Engineers are attached in accordance with the needs for bridge work, road work, road blocks, and engineer reconnaissance. When a crossing of a river is in prospect, a bridge train may be attached.

e. *Air service.*—Air service, while not attached to an advance guard, operates in close liaison with it and should furnish information direct to it.

f. *Chemical troops.*—Chemical troops will not ordinarily be attached except in case of large advance guards with aggressive missions, in which case chemical troops may be attached to cover expected attacks with smoke.

g. *Antiaircraft artillery.*—Antiaircraft artillery may be attached when the advance guard is a large force of all arms.

h. *Tanks.*—The inclusion of part or all of the tank component of a force will be of great assistance to their commanders in the accomplishment of their missions, especially if that component consists of fast tanks. However, the effect of such disposition upon the accomplishment of the mission of the force as a whole must be considered before such reinforcement is ordered. When it is likely that the immediate mission of the force as a

whole—such as, to seize certain terrain—can be accomplished without committing the bulk of the command to action, the greater part of the tank component can well be included in the advance guards to assist them in brushing aside relatively weak hostile elements. On the other hand, when it is likely that the immediate mission of the force as a whole can be accomplished only after committing the bulk of the command to action, it will usually be desirable to postpone the active employment of this component until the force as a whole launches its attack.

i. *Combat and field trains.*—Combat trains of the troops in the advance guard normally accompany their respective organizations, or they may be grouped in rear of the reserve. The field trains usually march with the field trains of the main body.

j. *Medical troops.*—Medical units accompany the advance guard in proportion to the probable severity of combat action.

14. *ORDERS.*—a. The march order of the command will prescribe such security measures for the command as a whole, as will be required by the situation, and the necessary liaison between security elements.

b. In general, the march order of the column will contain:

- (1) Information of the enemy and own troops.
- (2) Time and place of starting, route and destination of the main body.
- (3) Composition and commander of the advance guard.
- (4) Special instructions for advance guards.
- (5) Order of march of the main body.

c. *Advance guard order.*—In general, the advance guard order for the advance will contain:

- (1) Information of the enemy and own troops.
- (2) Organization (support and reserve).
- (3) Route and destination.
- (4) Initial point and time the support is to clear.
- (5) Distance the reserve is to follow the support.
- (6) Special security and reconnaissance measures.
- (7) Conduct of the advance.

15. *CONDUCT.*—a. *The advance guard commander.*—The advance guard commander is generally at the head of the reserve, or with the support if there is no reserve, but goes wherever his presence is necessary. He studies the terrain over which he is passing, and other conditions with which he is confronted, so as to be prepared to take immediate action in any emergency. When contact is imminent the advance guard commander should be with the support commander.

b. *Distribution of troops.*—The troops assigned to an advance guard are distributed by the commander into the support and the reserve. The support is divided into the support proper and the advance party. The advance party sends out a point which precedes it on the march. In a small advance guard the troops may be limited to a support, or advance party, and a point.

c. *Advance toward the enemy.*—The advance guard will protect its main body from the time the advance begins. The advance guard commander, from a study of the map, and knowledge obtainable of the terrain, will decide on the terrain features, which are to be secured by the advance guard on the march. The advance guard will generally march along the route of advance, from terrain feature to terrain feature, that is, by a series of bounds.

The distance at which an advance guard will precede its main body, and the time it will start, will be governed by the terrain features, and whether or not a reconnaissance detachment marches in the interval between the rear of the advance guard and the head of the main body.

The halts of an advance guard are regulated by the tactical situation and the terrain features of tactical importance. They do not necessarily synchronize with the hourly halts of the main body.

The advance guard takes its own measures for security. It reconnoiters all roads and terrain on its immediate front and flanks. Generally it will only receive incidental protection from the antiaircraft artillery, and must take the necessary passive and active measures against air attacks. Also, measures must be taken against possible attacks by armored cars, tanks, and mechanized forces.

When the command is marching in several columns, the advance guard maintains liaison with adjacent advance guards by the use of radio, mounted patrols, or motorcycle patrols.

d. Combat of advance guards.—The combat action of an advance guard is regulated with reference to the main body which it serves. The advance guard is put into action for the sole purpose of gaining or retaining advantages which contribute to the security or the tactical success of the main body. In general, the combat of advance guards deals with hostile security forces.

In the changing situation that ensues in a meeting engagement, the commander of the force immediately indicates his intentions to the column commander. The column commander indicates to the advance guard commander, his intentions for the employment of the advance guard. These orders are usually to secure a terrain feature, to delay the enemy, or to screen the development and deployment of the main body.

(1) When the enemy is advancing, the advance guard delays this forward movement by operations against the hostile security forces. According to the circumstances of the terrain it immobilizes or drives back the hostile leading elements, secures the essential terrain features, and extends on a relatively broad front to cover the deployment of the main body.

(2) The advance guard upon encountering weak forces will attack promptly to clear the route of march.

(3) The enemy on the defensive will generally attempt to screen his main position and deceive the attacker as to his dispositions by the employment of security detachments. The advance guard upon gaining contact with an organized outpost position will deploy on a broad front, protect the deployment of the main body, and execute intensive reconnaissance to determine information of the enemy position.

e. Advance guard action.—(1) Until hostile resistance is encountered, or information indicates the probability of contact with hostile elements, the advance guard will be able to cover a sufficient frontage by advancing along the route of advance and sending out patrols to reconnoiter important points to the front and flanks. When opposition is encountered, or contact is imminent, it will promptly deploy, attack, defend, or delay, as the situation may dictate.

(2) The advance guard employs, in general, the principles of attack, defense, and delaying action, for a unit of its size. The attack or defense will be on a broader front than is normal for the unit. It attacks with shallow depth, and does not hesitate to commit all reserves, even initially, when necessary to accomplish its mission. In the defense it extends over a broad front, with little depth.

(3) Upon encountering hostile resistance, or when contact is imminent, the advance party and the support promptly deploy along the route of advance. When the mission of the advance guard is to attack, and all of the advance guard is to be used in the attack, the support will generally be the pivot of maneuver in an envelopment.

(4) The reserve is the maneuvering force. So far as practicable, it is held well in hand for unified employment. The dissipation of its strength through minor detachments or piecemeal reinforcements of the support is scrupulously avoided.

(5) As soon as the situation indicates the necessity for it, the advance guard artillery increases its readiness for action. One echelon is posted in readiness so that it can cover the route of advance. The other echelon moves forward to a more advanced position. The advance guard artillery thus advances successively from position to position and is prepared to intervene promptly when hostile resistance is encountered. To facilitate prompt support, positions in close proximity to good observation are

sought. Air observation is usually essential for the long-range fires. In aggressive action by the advance guard, its artillery is deployed well forward. If the action of the advance guard is defensive in order to gain time for the deployment of the main body, the advance guard artillery may be echeloned in depth to insure continuity of fire support. Generally, the advance guard artillery opens fire without delay in hostile columns and interdicts hostile routes of approach.

f. Reinforcement of advance guards.—The reinforcement of the infantry of the advance guard is made only when the situation clearly demands it. Piecemeal reinforcement is generally only to be made when it has been forced by the enemy. The artillery of the main body, however, should be used as necessary to give the advance guard the proper support.

16. ADVANCE GUARD OF A MOTORIZED COLUMN.—When the movement of a motorized column requires march protection, the security detachments must be composed of troops whose rate of movement is faster than that of the column. The advance guard of a reinforced infantry regiment moving by motors, would comprise rifle, machine-gun, and infantry mortar elements, detachments of engineers, and medical troops, truck-drawn 75-mm. guns, and, if available, armored cars. Light fast tanks may be included if available. The tactical employment, as well as the deployment, of motorized advance guards is essentially similar to that of advance guards composed of slower-moving elements, except as affected by distances and rates of march. To secure the maximum value from the motors, the main columns should move at a uniform rate. The advance guard moves by bounds, so scheduled as not to retard the progress of the main body. Mechanized forces having an adequate rate of movement may be employed as advance guards of motorized columns.

17. ADVANCE GUARD IN A RETIREMENT.—A retreating force may require an advance guard, as it may be necessary to drive off attacks by armored cars or mobile troops, which are endeavoring to interfere with the retreat. It should be a combat team consisting of infantry and light artillery. It should include some cavalry, if available. Engineers should also be attached to clear away obstacles and to improve the roads where necessary.

Security for the Flank

18. DEFINITIONS.—In general, *flank security* embraces and is obtained by the coordination of all of the security means and measures outlined above.

A *flank guard* is any body of troops which is sent out by the commander of the main force as a special security detachment to protect his flank during a march.

Flank detachments, or patrols, are sent out by the commanders of units forming a part of the larger units for their own flank protection.

19. NECESSITY FOR FLANK PROTECTION.—*a. General.*—While marching columns are afforded all-around general protection, and the immediate front and rear of the several columns are given special protection by the use of advance and rear guards, the commander of any body of troops, regardless of its size, must always take positive action to insure the security of his command from flank attack. This is necessary regardless of whether or not the flanks are screened by other troops, for in warfare of maneuver the flanks of both large and small units are quite likely to be separated by gaps from the flanks of other large or small units. The flanks are especially sensitive during a retrograde movement, and protection must be secured against encircling forces.

b. Effect of flank attacks.—Not only are the flanks of a command the most vulnerable, and the place where an adversary is most likely to obtain decisive results, but the psychology of troops (especially green troops) is such that while they may not be surprised to meet the enemy directly in front of them, they have a feeling of helplessness and are likely to experience an immediate loss of morale, if suddenly attacked in the flank. From the viewpoint of the commander of the force, a serious attack on the flank may require him to maneuver his main body in order to resist the flank threat, thus deflecting its advance from the original direction assigned in the mission.

20. MISSION OF FLANK GUARD.—The mission of a flank guard is to prevent the enemy from bringing effective fire from the flank upon the main body during a march. The accomplishment of this mission is a complex and difficult role, and necessitates a knowledge at all times of the exact location of the enemy and of the main body which is to be protected. This requires accurate information of the enemy, rapid means of communication within the flank guard, and excellent liaison with the main body. In the performance of its mission a flank guard will usually have three specific duties:

a. *Reconnaissance.*—The flank guard must be able to reconnoiter well to the threatened flank and obtain information of the enemy by its own means, as well as in coordination with the more distant reconnaissance agencies.

b. *Security.*—Protection of the main body from surprise and attack is the principal role of flank guards.

c. *Combat.*—Finally, it must be able to stop the threat; and to do this, it may have to attack, defend, or delay. It may have to offer resistance only for a period of time necessary to allow the main body to pass a threatened point or series of points; or, in case the threat is such that the main body will have to maneuver, it may have to employ the tactics of an advance guard and gain time for the main body to deploy.

21. STRENGTH AND COMPOSITION.—a. *Strength.*—A flank guard may vary in strength from a small force of one arm to a well-rounded fighting force composed of all arms. Whenever possible, it should be composed of complete units, under one commander. In no case should its strength be greater than that necessary for the task.

b. *Composition.*—In the case of a movement of large forces, when the length of the column to be protected equals or exceeds a day's march, or in case of a march across the enemy's front, a flank guard should be detailed to function until the need for such protection has ceased. On other marches, new flank guards may be detailed from day to day.

Ordinarily troops for a flank guard are furnished from the main body but they may be detached from the advance guard at the proper time. In the latter case the advance guard should have suitable initial strength, or it should be reinforced from the main body when the flank guard is detached.

When a force changes the direction of its march the commander may detail the advance guard as a flank guard and detail another advance guard.

When marching in multiple columns and the situation is such that the flank is not seriously threatened, the exterior columns may act as flank guards.

c. *Governing factors.*—The composition, strength, and the proportion of the various arms detailed depends upon the following factors which always make up the tactical situation:

(1) *Own force.*—Its size and composition; whether it is composed of foot elements, horse elements, motors, or a combination; the number and length of its columns, and its rate of march.

(2) *Enemy force.*—Its proximity, strength, composition, mobility, and whether or not its action will require prolonged resistance by the flank guard.

(3) *Nature of the terrain and road net.*—This includes corridors of approach for the enemy; key positions that may be occupied by the flank guard; the distance of parallel roads from the main body; the distance at which the flank guard must operate from the main body.

d. *Necessity for mobility.*—As a rule troops possessing a high degree of mobility are required, such as cavalry or motorized troops, since they must either march greater distances than the troops with the main body, or must cover approximately an equal distance in a shorter period of time. The potential mobility of a flank guard should never be less than the mobility of the troops it is protecting.

e. *Troops.*—(1) *Air service.*—While the air service will not ordinarily be a part of a flank guard, in large commands it will be required to work with it. By its ability to reconnoiter at great distances it can give timely information and thus reduce the time necessary that the flank guard may have to block important avenues of approach.

In situations where communication between the main body and the flank guard is difficult an airplane should be detailed for liaison duties.

(2) *Cavalry*.—A flank guard may be composed entirely of cavalry (horse or mechanized) if it is present in sufficient strength. It is employed on the flank which is most exposed and by distant reconnaissance and by counterreconnaissance can give warning of the approach of hostile bodies, and also prevent the infiltration of small enemy detachments which may annoy the main body.

Cavalry is especially fitted to carry out extensive reconnaissance and perform liaison missions with the main body.

When no mechanized cavalry is available the armored cars of the horse cavalry operating under control of the cavalry commander, should be employed for distant reconnaissance and used to patrol roads which are possible avenues of hostile approach. In wooded country with few roads, it is desirable to have a large proportion of horse cavalry.

(3) *Infantry*.—If the road net is favorable and the distances to be covered are not too great, dismounted infantry may be used; but if the plan of operation necessitates rapid displacements, then the infantry should be transported in trucks. However, the truck park thus necessitated adds another element of the command which must be guarded.

If it appears that the mission will be principally one of delay, then the infantry component should be strong in machine guns; but if it appears that the flank guard may have to fight for a prolonged period of time on a defensive position, or attack, then the proportion of rifles to machine guns should be normal.

Tanks may be assigned if the nature of the terrain is such that they can operate and if there is a possibility that the flank guard will attack in the performance of its mission.

(4) *Artillery*.—It is usually desirable to have a large proportion of field artillery in a flank guard because of its range and consequent power of delay. In particularly favorable situations the principal component may be field artillery with only sufficient other troops to insure its protection. At night or in close country the value of artillery will be reduced materially and the proportion should be reduced accordingly. When a serious fight is expected, the proportion of artillery should be sufficient to provide a well-balanced force. While the artillery support is usually provided by artillery attached to the flank guard, at times the location of the main body may be such that the flank guard may be given additional support by long-range fire from batteries of the main body placed in successive positions along the route of march.

Antiaircraft artillery is not usually attached to a flank guard, unless it is a large force of all arms.

(5) *Engineers*.—The engineer component should have a high percentage of demolition detachments, since its principal task will be the construction of road blocks and the execution of demolitions. It will also assist in the usual work of repairing bridges or other road repairs where necessary for the maneuvers of the flank guard.

(6) *Chemical troops*.—The use of persistent gas is one of the most efficacious means of delaying a hostile advance. Whenever troops are available they should be used in connection with engineers in spreading persistent gas.

Smoke may be of value in denying hostile observation of the main columns.

(7) *Reconnaissance detachments*.—Motorized reconnaissance detachments may be sent out to meet a particular threat where a single terrain feature or avenue of approach is involved, or may be used to act as a mobile reserve for cavalry, or to relieve cavalry already engaged, to allow it to continue on reconnaissance or other missions.

(8) *Signal troops*.—Communication between the flank guard and the main body is one of the most important essentials. In addition to airplane and motor liaison and radio the situation may be such that commercial telephone circuits can be used to facilitate communication. In such a case a small detachment of signal corps personnel should be used.

22. CONDUCT.—*a. Distance from main body.*—The distance at which a flank guard must operate from the main body is fixed by its mission—it must not allow the enemy to bring effective fire upon the main body. This requires a consideration of the road net, key terrain features, time it will take the main body to pass dangerous avenues of approach, the time it will take the main body to deploy to that flank in case of emergency, the support, if any, the flank guard may expect from the main body, and the method of employment which is to be used by the flank guard.

It must be kept in mind that the flank guard will usually meet superior forces and it must have room to maneuver, especially if its method of employment calls for a delaying action. On the other hand, it must not operate at such distance from the main body as to allow a mobile enemy to get between it and the force it is protecting. If its plan of action contemplates a defense in one position it may be closer.

b. Formation.—The flank guard must not only give security to the main body but, as in the case of all other such detachments, it must provide for its own all-around local security.

It must have depth in the direction of the enemy, and, if it is marching parallel to the main body, must also have depth in the direction of march.

c. Methods of employment.—The operations of a flank guard necessitate an accurate determination of the possible avenues of approach and key terrain features on the flank of the main body, and a careful evaluation of the time and space factors with reference both to the movement of the enemy and the movement of the troops to be protected. Depending upon the situation, there are three general methods of employment:

By moving on a route roughly parallel to the route of the main body.

By occupying one key position.

By occupying several key positions.

(1) *Moving on a parallel route.*—When a route generally parallel and at a suitable distance from the main line of march exists, and continuous flank protection is required throughout the depth of the column during the march, the flank guard marches parallel to the main body. It may move with its head on line with the advance guards, or opposite the center of the columns which it is protecting, depending upon the avenues of hostile approach.

It pushes reconnaissance well out to the flank and has small detachments, patrols, or road blocks capable of offering considerable resistance at probable avenues of approach; and a reserve is marched in a central location from where it can be moved to any of the threatened points.

Such a method may be used where there is no important obstacle between the flank guard and the main body; or if such an obstacle exists there must be ample avenues of communication over it.

(2) *One key position.*—The road net or the terrain may be such that the enemy is limited to a definite avenue of approach. In such a case the flank guard may move directly to a single key position, the possession of which will afford the necessary protection to the main body during the day's march or until the mission is accomplished. This key terrain feature may be so located as to command a large area and may be used as a defensive position, as one of several delaying positions, or as a location from which to engage in flank or neutralize an enemy threat to the main body. Such a scheme economizes in troops.

(3) *Several key positions.*—If threats are feared from several avenues of approach, each of which the main body must pass successively, it is necessary to occupy each of these positions in one of two ways:

By the same flank force occupying the several key positions successively and for a predetermined time, or,

By several flank forces detached in turn from the main body and held at the threatened points until the main body passes.

(a) The first method, like the occupation of a single key position is economical in troops. It may be used when the mission of the command requires that it reach its destination with a maximum of troops in hand or when the danger of attack is not imminent. The execution of such a series of maneuvers requires much skill on the part of the commander of the flank

guard, since it must be able to displace faster than the troops it is to protect and hence must be composed of highly mobile troops, with rapid means of signal communication, and a large proportion of reconnaissance elements. This method also requires a suitable road net and can be executed only when the flank to be covered is limited in depth.

(b) In some situations enemy avenues of approach which threaten the safety of the main body may be separated by great distances. In such cases the distance between covering positions precludes their occupation successively by a single flank guard, or detachments thereof. Key positions are then occupied by separate flank guards, which are detached from the main body as the situation requires, and which operate in the same manner as a single flank guard.

d. *Relief from positions.*—The determination of how long each position should be held demands accurate calculations of time and space factors. The strength and dispositions of enemy forces must be known. The commander must calculate how long it will take the enemy to develop for an attack against the positions, and how long he must hold to allow the tail of the main body to clear threatened areas without danger from enemy fire.

As soon as the necessity for the occupation on the flank has ceased, the flank guard may either become a rear guard, reinforce a rear guard already constituted, or join the main body.

23. **ORDERS.**—The field order of the command contains a reference to the flank guard. The order for the flank guard commander assigns the troops and gives the commander of the flank guard his mission.

The Rear Guard

24. **DEFINITION.**—A rear guard is a security detachment which protects the rear of a marching force.

25. **MISSION.**—The rear guard relieves the main body from the necessity of engaging in combat, permitting it to proceed to its assigned march objective without interruption from hostile ground forces. In order to accomplish this mission it must hold the enemy at such distance from the main body that his weapons of longest range cannot be effectively employed against it.

26. **STRENGTH AND COMPOSITION.**—a. *General.*—The strength and composition of the rear guard varies between wide limits, depending upon the mission assigned, the terrain and road net over which it will operate, and the attitude and capabilities of the enemy. In protecting the retirement of a large force, the presence of all arms may be required, while the rear guard of a force which is marching toward the enemy may only require a small infantry detachment. Because of the usual necessity of gaining time for the movement of the main body, a rear guard should contain weapons of the longest range available; to facilitate rapid movement and maneuver, it should contain troops of a high degree of mobility; to insure control by its commander, it should be furnished an adequate staff and communications personnel consistent with its size and the area of its responsibility.

b. *Infantry.*—The infantry component is usually made strong in machine guns and mortars, where it can be foreseen that delay of the enemy by the employment of long-range weapons will facilitate the accomplishment of the mission. The rifle strength is kept to a minimum consistent with the protection of the weapons of long range. The rifle strength is increased to normal proportions only when its employment can be foreseen for a stubborn defense, or for offensive action against a careless or highly aggressive enemy. When appropriate, additional communications personnel and motor transportation should be included as part of the infantry in order to insure rapid and efficient communication and control over wide frontages. Antitank weapons organically belonging to the infantry should accompany it for protection against mechanized raids or tank attacks.

c. *Field artillery.*—Because of its ability to delay the enemy at long ranges, forcing his premature deployment, rear guards are made especially strong in artillery. It compels the enemy to march across country in approach formations, or to use circuitous routes in order to obtain cover and

concealment. Truck-drawn light artillery, because of its high degree of mobility, and medium artillery because of its power in long-range interdiction, are especially valuable.

d. Cavalry.—(1) Cavalry is especially suitable for duty with rear guards. Its mobility enables it to reconnoiter well to the flanks, to operate over a wide front, to vary its action, and to withdraw quickly after delaying the enemy to the last minute. As part of a rear guard composed of all arms, it may be employed in offensive action against the flanks of a pursuer, or for reconnaissance and delaying missions to protect the rear guard against surprise attacks from unexpected directions.

(2) Horse and mechanized cavalry perform the same types of missions. Mechanized cavalry, because of its superior speed and radius of action, can, on suitable terrain, operate at greater distances with minimum risk. It is especially effective in harassing action against the hostile flank or rear, or to meet a pursuing force which operates at a considerable distance beyond the flank. It is relatively less effective than the horse elements in mountainous or thickly wooded terrain, or in a locality cut by numerous streams whose crossings can be obstructed.

e. Engineers.—Engineers should be attached in proportion to the probable demands for demolitions, obstructions, road work, and other appropriate duties.

f. Tanks.—Tanks (especially fast tanks) are a great aid. By counter-offensive action they assist in gaining time.

g. Chemical troops.—Chemical troops are usually attached in appropriate strength. By the employment of gas mines in connection with engineer demolitions, they assist materially in retarding the enemy's progress. By the employment of persistent gas in connection with the chemical mortars they interdict hostile routes of approach at long ranges, and by the employment of smoke they can materially assist the infantry in withdrawing from exposed positions.

h. Motorized reconnaissance detachments.—Motorized infantry with appropriate attachments of truck-drawn artillery, antitank weapons, chemical troops, and engineers assure the presence of a mobile combat unit which can be employed as the situation dictates. In the absence of a specific threat to a flank of the rear guard, such a unit should normally be held in readiness at a central location. Should an enemy threat develop, such a force can readily be dispatched to meet it, either in conjunction with rear guard cavalry, or alone.

i. Air service.—While air service is not normally attached to rear guards, it should support the action of the rear guard with all the means at its disposal, performing reconnaissance and battle missions, and assisting in the maintenance of communications. If the rear guard contains medium artillery, a balloon squadron should be attached in order to assist this arm in the performance of its long-range fire missions.

27. *ORDERS.*—The field order of the command contains the instructions pertaining to the rear guard, and should state briefly the means to be assigned to the commander, and a definite clear-cut mission. The mission is deduced from a careful calculation of time and space factors concerning the rear elements of the main body. The mission assigned should require the rear guard to perform a specific security operation for a definite period of time, and should obviate the possibility of endangering unnecessarily the safety of the rear guard itself. Thereafter, it is incumbent upon the commander of the whole force to keep the rear guard commander informed of the progress of the main body, since an unforeseen delay might require a radical change in the rear guard mission.

28. *CONDUCT.*—*a. Control.*—Control of rear guards and rear guard action may be greatly decentralized to column commanders, or it may reach a high degree of centralization by the detail of a single rear guard to operate under a single commander. In the former case, the conduct of the rear guards of the various columns is prescribed in very general terms. Coordination of their action is effected by the commander and his staff by prescribing phase lines or terrain features to be held for definite periods of time, or by maintaining close liaison with the column commanders, employing frag-

mentary orders and messages as required by the situation. In the latter case control is exercised by issuing orders and instructions directly to the rear guard commander, upon whose shoulders rests the entire responsibility for the security of the main force. The method to be adopted involves an important command decision by the commander of the whole force, and depends upon the attitude and capabilities of the enemy, the frontage to be covered, and the road net.

b. Distant pursuit.—(1) When the enemy is following at a considerable distance, the rear guard follows the main body in march formation. It maintains contact with the enemy by means of its cavalry or other mobile reconnaissance agencies, while it retires upon successive terrain features prepared to offer resistance or delay should the enemy situation demand it. Its greatest danger is on its flanks. Routes by which the enemy may reach or pass the flanks of the rear guard are covered by reconnaissance, and when necessary by a force of sufficient strength to prevent outflanking operations. Road blocks and demolitions are employed to the maximum means available to effect delay and interference with the enemy.

(2) *Formation and functions of elements.*—In march formation the rear guard is divided into a reserve and a support.

(a) *The support.*—The support may consist entirely of infantry or cavalry, or of both infantry and cavalry. A small force of cavalry is desirable for flank reconnaissance. A rear party is detailed by the support commander. Its duty is to protect the retirement of the support, and to cover its occupation of delaying positions. A rear party of cavalry should be able to accomplish minor delays without falling behind.

(b) *The reserve.*—The reserve consists of the greater part of the rear guard, and contains the bulk of the delaying power. It operates by retiring upon successive terrain features which are held in force until the main body has passed safely beyond them. This mission is usually accomplished by the employment of delaying action. However, should a pursuing enemy become so aggressive as to threaten the main body, it must be prepared to launch a counterattack in order to definitely check the pursuer and gain time and space for the retiring main body. Defensive action is to be avoided. To permit an enemy to launch a coordinated attack against its position, in which close contact is gained with it, is to invite heavy casualties or complete destruction of the rear guard. The order of march of the reserve should favor prompt deployment of its components without countermarching.

(c) *Distances between elements.*—In small commands the distance between the support and the reserve is determined by the consideration that the support must protect the reserve and not be driven back upon it. The distance should not be less than the range at which small-arms fire of the reserve can cover the withdrawal from action of the support. In large rear guards the reserve will ordinarily cover the withdrawal of the support with long-range machine-gun and artillery fires.

The minimum distance between the reserve and the main body is governed by the considerations that it must not be driven back upon it, and that it must prevent the enemy from firing upon the main body with its weapons of longest range. The maximum distance is determined by the consideration that the enemy must not be able to cut off the rear guard.

c. Close pursuit.—When disengagement from the enemy has been effected, preparatory to a retirement, a rear guard or rear guards should be in position to take over the mission of security for the retiring columns of the main body. In addition it is the duty of rear guards to protect the retirement of covering forces. If the attitude of the enemy, the road net, and the frontage to be covered favor it, the detail of a single rear guard is preferable. This permits the commander to assign to it appropriate means for the accomplishment of its mission, while the rear guard commander is allowed time for reconnaissance and occupation of initial positions. In such a situation, the availability of formed reserves is an important consideration. When the enemy situation is threatening, when the frontage to be covered is so wide as to obviate control by a single commander, and when troops are not readily available for this duty, decentralization to column commanders is necessitated.

In the case of close pursuit by the enemy, rear guards are relatively stronger than when pursuit is distant. There should be a material increase in the proportion of long-range weapons, and if time permits, special combat teams may be organized which will facilitate command, control, and delaying power. When the situation requires long delays, rear guards employ delaying action in one position or in successive positions, or by counteroffensive action. In general, the principles of delaying actions apply to rear guard actions.

Security Without Cavalry

29. **GENERAL.**—*a.* When cavalry is not available to the division or the brigade for security and reconnaissance, the use of motors facilitates reconnaissance, gives greater security, and conserves the strength of the foot elements of the command. Motorcycles, passenger cars, or light trucks, may be used for this purpose. Division and brigade reconnaissance detachments may be used for distant ground reconnaissance and security. The use of motorized detachments does not relieve the foot elements of the command of their close-in reconnaissance and security duties.

b. Vulnerability.—All motorized detachments present an extremely vulnerable target when halted on the road. While less vulnerable when in motion they will at times present an excellent target, especially for automatic weapons. The size of the target increases and its mobility or maneuverability decreases when the number of vehicles is increased.

c. Security.—A motorized detachment of any size which is sent out toward the enemy, will have a smaller motorized unit precede it. These detachments will generally advance by bounds from terrain feature to terrain feature.

30. **ADVANCE TOWARD THE ENEMY.**—Division or brigade reconnaissance detachments will generally precede the advance guards, and will normally advance by bounds. All covered areas will be reconnoitered. If more than one reconnaissance detachment or motorized detachment is protecting the advance, measures should be taken to coordinate their actions. Motorized detachments or motorized patrols should execute all distant ground reconnaissance. Motorized detachments may be used to protect the flanks of the command. In general, their duties are the same as for cavalry in similar missions. A small number of motors may be attached to the advance guards for distant reconnaissance and liaison.

31. **MARCH AWAY FROM THE ENEMY.**—When contact is broken in a retirement, motorized detachments may be used to maintain contact with the hostile force, to protect the flanks of the command, and for distant reconnaissance. In close pursuit, motorized detachments may be used to protect the flanks of the rear guard or the main force, and for distant reconnaissance.

32. **SECURITY AT REST.**—Motorized detachments should be used for distant ground reconnaissance and for security in accordance with the principles outlined in the preceding paragraphs.

Reconnaissance Detachments

33. **GENERAL.**—Whenever conditions warrant, the commanders of reinforced brigades, of divisions, or of corps will organize a reconnaissance detachment or detachments and will use them as the situation demands.

The term "reconnaissance detachment" is generic. The particular detachment is further designated by the name of the unit of which it is a part, as "Brigade," "Division." Example: Brigade Reconnaissance Detachment.

When there is more than one such detachment in a unit, such as a division, they will be called, "Division Reconnaissance Detachment No. 1," etc.

34. **BASIC PURPOSE.**—The basic purpose of a reconnaissance detachment is to utilize motor transportation in order to provide a highly mobile combat force of considerable fire power, which will augment the effectiveness of the brigade or division as an integrated fighting machine. The

reconnaissance detachment supplements but does not supplant the duties of division cavalry. It allows the divisional cavalry during the advance and contact phase to be used primarily for its principal roles—reconnaissance and close-in security for the division. It enables the commander to support the cavalry in overcoming resistance; and tends to insure the availability of the horse cavalry for proper horse cavalry missions which can be or are better performed by motorized reinforced infantry detachments—saving the horse cavalry for the day when its role may become paramount; when due to fog or rain, weather or terrain, it will be the ONLY mobile agency which can perform the necessary reconnaissance and security missions.

a. The detachment is available to increase the security of whatever unit with which it is working—such as a marching column of a brigade or division or a flank or advance guard, and thus as one of the available security detachments, assist the commander in retaining full freedom of maneuver until such time as he decides to employ his main forces.

b. To enlarge the radius of action of the several columns through this mobile fire power.

c. To give to commanders a mobile detachment with which they can brush aside weak enemy resistance that can not be avoided, or to quickly cover the movements of the columns.

d. To assist the division cavalry, and last but not least,

e. From the viewpoint of your training in the school, to aid in the development of modern tactical doctrine and to guide your thought along these lines.

35. NEW UNITS.—Up to the present time your instruction has dealt with units in the brigade which are in actual existence in our army, such as infantry and artillery regiments, tank companies, and air service. But we also take up instruction in new units such as antitank battalions, line of communications troops and reconnaissance detachments; and you are being given a conception of the far flung security which we believe will be necessary in modern warfare.

The division with which you have worked to date, including probably all of your previous training, is Model 1921—which is largely the result of our World War experience, at least partially out of date at the time it was organized, and no doubt influenced in its conception too much by the immediate post war thought. It is basically organized for slow, methodical attacks and rigid defenses. Its road length is as excessive as its echelons of command; and with its four speeds—foot, horse, tractor and truck, it is unwieldy, uncoordinated, uneconomical, and is lacking in and not adapted to modern means of mobile warfare.

In the past decade and a half the industrial world has given us great improvements in the mechanical field, and these developments in weapons and transportation have been injected from time to time into the body of the old division giving it a temporary lease on life; but up to the present time, no corresponding changes have been made in the original framework of brigades, regiments, battalions, and special troops. The result has been that for a period of years the natural impetus to the growth of tactical thought, which should accompany modernization in matériel, has been fettered by the static and archaic form of the basic structure.

We teach tactical principles in this school, and for that purpose almost any kind of division can be used as a vehicle for instruction; yet our own division has long since ceased to offer much in the way of framework on which to hang the development of modern tactical doctrine. And so the school has decided to anticipate the organization of a modernized, mobile, and maneuverable division, and incorporate into the division as we now have it, elements such as antitank units, line of communication troops, and reconnaissance detachments. The General Staff is about to turn out a new model division and pending its adoption we have incorporated in the old division certain modern elements which we believe will be beneficial. The school has already started to develop the tactics of these new organizations.

36. COMPOSITION.—The reconnaissance detachment which we teach is not like those you may have read about in foreign armies which are separate

units in the division. Of necessity the one we use is improvised because it must be made up from units in the division. Its organization is variable to meet different requirements according to the situation, the mission, and the terrain. It must have mobility and fire power; and the fire power must be concentrated since the means of transportation is limited. The strength and composition should always be the minimum number of organizations considered capable of performing the missions that may be assigned to it. An estimate of these probable missions should therefore be made by the commander before he organizes the detachment. For example, a detachment which is made up with a view to assisting the division cavalry in overcoming minor resistance during a march would probably be lighter and composed of different units than one that is made up for a delaying action. In the first case one battery of artillery may be sufficient and a chemical platoon might not be necessary, while in a delaying action it may be necessary to have a battalion of artillery and a company of chemicals, and engineer demolition detachment with just enough other troops to give these units protection. Generally speaking, it consists of small detachments, armed with rifles and machine guns, transported in motor vehicles. It may or may not be reinforced with truck-drawn artillery, engineers, signal, or chemical troops, depending on its mission.

When the mission or phase for which it was organized is completed, the detachment may be dissolved, the units reverting to their organizations, and another one organized when the need arises. These detachments may be composed of different organizations on different days just as in the case of advance guards.

37. NUMBER.—In a reinforced brigade there will normally be motor transportation available for only one reconnaissance detachment. With a division two such detachments may be organized.

38. ORGANIZATION.—In order to simplify the organization of the reconnaissance detachments and their assembly, as well as to weaken only one infantry regiment the rifle and machine-gun companies should be taken from the same regiment. The brigade or division will usually be marching in reinforced regimental columns with one battalion of infantry in the advance guard. In deciding from which columns to take these infantry elements, the division commander should plan ahead and consider his probable scheme of maneuver in case it becomes necessary for him to attack or defend. He should take his infantry companies from the units which he plans to use as his brigade and division reserve, as far as practicable.

a. *Headquarters and signal.*—As far as is practicable the headquarters personnel and signal equipment should be taken from the division signal company, but a small command detachment from the headquarters and headquarters company of the battalion which furnishes the commander may be necessary. The commander will want some of his own headquarters personnel in this section.

For each detachment (the division signal company can organize two, and a separate brigade can furnish one signal detachment) we can get the following equipment:

One radio section with operators and panel set including drop and pickup equipment. That will give the detachment the means to communicate with the division and with the air.

One mile of wire and two linemen.

Four telephone operators, two telephones and a switchboard.

About two motorcycles for messenger work.

This will give the means to augment the signal agencies of the battalion headquarters and augment a headquarters if two detachments are combined on one mission.

From the battalion headquarters from where the commander comes we take a command detachment. The number of men that the commander will take from his battalion headquarters will depend upon his own desires. He will probably leave the executive behind to command the remainder of the battalion (he may have one executive command the detachment), but

will take at least his plans and training officer, his intelligence officer, and a detail from his intelligence personnel of scouts and observers, and part of the communications platoon, including two message center clerks, two runners, and a motorcycle messenger.

b. Infantry.—Because the reconnaissance detachment is an additional security unit to the normal advance guard, it is believed that the advance guard can spare one of its rifle companies. To take the rifle company from one of the battalions with the main column would break up the rifle units of another battalion and further weaken that particular regiment.

On the other hand, the machine-gun company with the advance guard may be needed by that element, and so it is necessary to assign the machine-gun company from some other battalion. The one least likely to be used in the early stages of combat is from a battalion which will probably be used as the division reserve.

c. Artillery.—To give the detachment fire power with which to reduce defended road blocks, to use against enemy columns to make them deploy, or to reinforce the fires of the advance guards, a battery of field artillery is needed; and in order to have the same mobility as the units with which it is to operate it should come from the 2d Field Artillery, which is truck-drawn.

d. Engineers.—In general, troop movements by motors, should have included in the column, when available, engineers to facilitate movement—and a reconnaissance detachment is a motorized unit. Roads may become defiles. When it can be foreseen that the detachment may become involved in delaying actions, a large number of demolition units should be included in the engineer contingent. Engineers may be called upon to establish road blocks, at times for combat.

e. Chemical troops.—The mission may be such that chemical troops are desirable. The platoon being the fire unit, it is proper to assign a platoon to a detachment. The company headquarters will always be left behind.

f. Antitank platoon.—The trucks of the detachment will be very vulnerable to an attack of armored vehicles which might slip through the cavalry screen, not only when they are on the road but when they are parked. The truck park is always a source of worry to a commander. A platoon of .50 caliber antitank guns is therefore necessary not only for protection of the column during the march but after detrucking to protect the park, and also to give additional protection to the area which will be occupied by the artillery battery. This platoon should be taken from the division antitank battalion, rather than from one of the regimental antitank companies because the regimental antitank company is to furnish protection for all elements of the division, particularly areas not included in infantry regimental areas. If there is no mechanized threat there will be no need for this platoon.

g. Medical.—The medical personnel will also come from the battalion from which the reconnaissance detachment comes.

The doctrine observed in organizing the medical detachment is that the parent units from which the subordinate elements of the reconnaissance detachment are taken shall contribute medical personnel in proportion to remoteness of need for the services of the detached men. Thus, the advance guard is far more likely to have immediate need of its battalion medical section than the battalion destined to act as reserve. The minimum subtractions should therefore come from the advance guard battalion.

Most of the medical personnel will come from the reserve battalion, including the detachment surgeon. It is believed that the lieutenant colonel commanding is more likely to want a surgeon with whom he is familiar and whose work he knows, than one unknown to him. Similarly, the surgeon wants men with whom he has worked and whom he knows. This would seem to take a heavy detachment from the reserve battalion and it does. However, this unit will not go into action for some time. If it has to be used, its depletions can be supplied from the regimental medical detachment.

Medical supplies will come from the reserve battalion medical section and should be transported in a truck. At least one motor ambulance should accompany the movement and come from one of the ambulance companies.

Evacuation from the reconnaissance detachment aid station will be by division motor ambulance on call.

The aid station will be established near detachment headquarters and evacuate as much as possible by motor transport, wounded already given first aid by company aid men with the combat units. Division will evacuate on call.

Approximate Strength of Detachment:

1 Officer

1 NCO

11 Pvts.

Transport:

1 truck and 1 motor ambulance.

h. Trucks.—The trucks for the detachment must come from a motor transport company, and the number will, of course, depend upon the strength of the unit you make up. Of the units listed in the type detachment, the battery, chemical platoon, signal detachment, antitank platoon, medical and part of the command detachment will have their own motor transportation. We have to provide for the remainder.

According to *Reference Data* a rifle company takes fourteen trucks. You will note that the machine-gun company calls for 9 trucks for personnel and individual equipment and six additional if carts are taken (we have no use for the carts). In this case it is preferable to organize the machine-gun company into squads and sections for tactical purposes; and so it will be "combat loaded" rather than loaded to capacity of the trucks, which is 15 men per truck.

There are a number of personnel in the machine-gun company as clerks, and men whose normal duties are to care for the animal elements that we do not need. The 15 trucks provided for in *Reference Data* will load the twelve squads—one squad, its Matthews mount, and ammunition in each truck—and leave three trucks for the headquarters and platoon leaders, etc. An engineer platoon will take two trucks and the command detachment may need a couple.

In asking for a given number of trucks from the Quartermaster Regiment it is probably better to ask him for the number you want. Do not confuse this with Command, Staff, and Logistics problems on troop movements where they hold you to the *exact* number of trucks to move troops regardless of their combat loading. It would not be wrong to ask for a platoon, or a platoon plus a section if that is what you want. If you ask the quartermaster for any given number of trucks, he will take the nearest platoon or section or company that will fill your number required, add a few for spares, and give it the necessary overhead to run the convoy—that is his business.

You may want a few motorcycles for messenger work—and if so ask for them from the division motorcycle company.

It must be kept in mind that when the detachment is out of its trucks, it is just another reinforced infantry combat unit, but of less mobility than if it had never been entrucked and lacking many of the supplies and auxiliaries of the ordinary infantry regiment. The trucks must be protected and the troops will have to detruck in a zone of safety. The trucks are as difficult to protect as the led horses of the cavalry.

i. Reconnaissance agencies with the detachments.—When reconnaissance detachments are formed, special reconnaissance agencies may be detailed to accompany them on special missions. For example, there may be such groups from the artillery, from the brigades, or staff officers from the division staff (as representatives of G-2 or G-3) or the officers with the various detachments may perform for their higher units the duties of reconnaissance, for certain specific information.

39. LIAISON.—In all situations provision must be made for liaison and communication with air service, with the division cavalry, and with the main body through its advanced message center. When the situation dictates, the air service should be directed to communicate directly with the reconnaissance detachment.

When a detachment goes forward to the aid of cavalry, for example, the advance guard commander whose unit is the next in rear, will undoubtedly send forward a liaison group from the battalion headquarters of his advance guard to get information. The intelligence personnel from the reconnaissance detachment headquarters will be interested in intelligence from their own viewpoint—and the battalion commander of the advance guard is interested in enemy information from his viewpoint.

40. PLACE IN COLUMN.—When cavalry is present the reconnaissance detachment will normally march by bounds in the interval between the rear of the foot elements of the advance guard and the head of the main body. It may be marched at the head of the motor column with the anti-tank unit acting as the advance guard for the detachment.

Thus in the usual situation the detachment will be moving in a zone protected by the horse cavalry and the foot elements of the security detachment. The depth of this zone may be from 15 to 25 miles, depending on the location of the horse cavalry. If the detachment is sent out ahead of the horse cavalry, it must be escorted by the armored cars and scout cars, in addition to the protection it will be able to give by its own elements.

When it once gets out from behind the advance guards, it will be in danger. Whenever possible its development should take place under the direct protection of the cavalry.

These limitations and the size of the unit must be taken into consideration when assigning missions. Keep the missions to those you think can be accomplished.

This is another reason why the size of the group as a whole should be restricted. The length of a type detachment is roughly a mile. If you get it too long it can not march in the interval between the advance guard and the main body without putting the advance guard out a considerable distance. Since the mission of the advance guard is to give local security to the column and incidental security to the reconnaissance detachment, there is a limit to the distance to which it may be pushed ahead. This is particularly true if the command is subjected to a mechanized threat.

41. COMMAND.—Reconnaissance detachments are fundamentally agencies of the separate brigade or division commander and those commanders are responsible for their organization.

In a division, for example, reconnaissance detachments may operate initially under brigade control, or, they may be held initially under the control of the higher commander and then one or both be turned over to brigade or column commanders for definite missions. Whether they operate under column, or brigade, or division control will depend largely on the mission and the terrain. Two or more detachments may be combined for operation under one commander.

The higher commander must organize them for the following reasons:

a. The brigade or division commander is primarily responsible for the security and reconnaissance of his command.

b. Many of the units which may be included in the reconnaissance detachment (such as engineers, chemical troops, and trucks) are directly under the control of the division commander.

c. The information upon which the detachment may be employed is obtained generally from reconnaissance agencies which are directly under the control of the commander, as the air service and G-2 agencies.

In a brigade, the reconnaissance detachment will normally operate under the orders of the brigade commander. However, it may be desirable to turn it over to a column commander for employment under the following conditions:

(1) When the columns are marching a considerable distance apart and are separated either by a considerable distance or by a terrain feature. The reconnaissance detachment might then be attached to the brigade on the flank with the greatest threat.

(2) When, during a march, a small flank threat appears on the flank of a particular column. If it is a large threat which may ultimately involve brigade units, it would probably be best to handle it under brigade control.

(3) When the advance guard and reconnaissance detachment have met resistance which they are unable to overcome and it appears that they will have to be reinforced by other elements from the column.

On the other hand, the situation may be such that the brigade commander may want to step in, and coordinate the efforts of the two columns. For example: Suppose one column was echeloned behind the other, and after a series of contacts the reconnaissance detachment had been employed and was unable to make progress. The brigade commander might well step in and direct the employment of the advance guard of the other column in an envelopment. He may direct the other column commander to do the same thing, or, he may direct the reconnaissance detachment to hold and use both of the advance guards in envelopments.

42. ORDER OF MARCH.—The order of march within the column will depend upon the composition of the detachment. When action is imminent the commander with a small party will precede the detachment.

If the mission requires an engineer detachment it should be placed well forward in the column so that it will be available to facilitate the march in the event that roads or bridges need repair.

The rifle company should precede the battery and chemical detachment if one is included, to give them protection and to be in position to establish a march outpost immediately whenever a halt is made.

The machine-gun company may follow the rifle company, or, when there is a threatened air attack, it may be distributed by sections throughout the column, in order to give all elements of the command added antiaircraft protection.

When the detachment leaves its place in column to go on a mission, the antitank platoon is used to give it all-around protection during the march. After detrucking, the antitank platoon protects the truck park and the artillery area.

43. EMPLOYMENT.—*a. General.*—The method of employment of a reconnaissance detachment is similar to that of any other organization in attack or defense composed of similar units. The detachment should habitually be moved by trucks as far forward as cover and protection for the trucks can be secured in order to take advantage of the mobility of the trucks and to reduce the marching time of the foot troops.

After detrucking, the truck park must be made as secure as practicable by natural obstacles, by the use of the antitank elements, and by individual armament of the drivers.

The reconnaissance detachment is concerned primarily with *security* and *combat*. As part of a security force, it will be used to clear the way of hostile small units and obstructions for the advance of the main body, while the foot troops of the security force (engineers and infantry) will repair roads and bridges and furnish the local security for the main body and protection for the detachments which must do the pioneering.

b. Appropriate missions.—Keep in mind the size of the unit when you are using it. It is roughly the equivalent in fire power of a reinforced infantry battalion, so do not give it missions beyond its power. The method of employment is similar to that of the organic units of which it is composed. Some of the missions for which the reconnaissance detachment may be used are:

(1) *Clear the way for the advance of the main body.*—This is probably its most important mission and it may be performed either in conjunction with the cavalry, by itself, or with the advance guard. For example the cavalry may have a mission of reconnaissance, and during this mission it comes onto small enemy resistance. It would take considerable time for the cavalry commander to gather his squadron or troop or whatever he has from the front of which he was reconnoitering (the brigade cavalry can cover a front of 10 miles) and bring them to the place where the resistance was encountered—and in the meantime he would not be performing his mission. But he can leave a patrol to keep the enemy unit under observation—notify the column or brigade commander—and he in turn can send out the reconnaissance detachment to reduce the resistance. It may be only an isolated point. On the other hand it may be one of a number of

similar obstacles out ahead of an enemy defensive position—and if it is then the cavalry will find the others—and it may be necessary to exploit them in turn. In such a situation the entire enemy automatic fire screen will be developed—at least its general contour—and the commander will get additional information of what he may expect in front. All this is done at such a distance from the main body that it will not stop its march, if it is only small resistance; and if it is not, then the commander has time and space and information on which to base changes in his dispositions. Thus the reconnaissance detachment is used to go out ahead and clear the way of enemy small units and obstructions for the advance of the main columns while the foot troops of the security elements—engineers and infantry—will make the necessary repairs to roads and bridges for the heavier elements of the division, afford local security for the main body, and protection for the detachments which might be pioneering.

When the road block is reduced the reconnaissance detachment may be ordered to take position to cover the advance of the column and when passed through by leading elements of the advance guards, reassemble in rear of the advance guard infantry, or, it may be necessary to send it out on some other mission.

(2) *Seize and hold advanced positions until the arrival of foot or horse elements.*—The detachment can hold a small terrain objective for a considerable period of time—at least until the enemy gets up superior fire power. But do not send a boy out to do a man's job. If you have a terrain feature to secure and you need a lot of troops to get it, then it is not the job for a reconnaissance detachment—send a large command—all the infantry and engineers you can get in all the motors you can lay your hands on and all the truck-drawn artillery and other motorized elements you can get together and give it a headquarters commensurate with its size. On the other hand if you were advancing to the Missouri River from the west for example to take up a river defense in this area, and the cavalry had the mission of observing the river say from Atchison, exclusive, to Leavenworth, inclusive, until your arrival, you could relieve the cavalry at the two bridges—the one here and the one at Leavenworth. Those terrain features might well be taken over by a reconnaissance detachment at each place—and relieve the cavalry at those points, and allow it to employ all of its force along the remainder of the river.

(3) *It may be used for a reconnaissance in force*, where it is necessary to assist the horse cavalry in clearing up a situation. Combat is usually necessary when you wish to know the nature and strength of the enemy—and you have to pierce a screen on a limited front to find out what lies behind. If the action is successful, the cavalry can go ahead and the march of the advance guards and the main body will not be slowed up or stopped. If the action fails then you obtained information concerning the enemy strength at a point where it has struck with all of its concentrated power. If possible it will renew its attack at another point. In any event it will notify the air service which will seek to observe beyond the line where the cavalry and the reconnaissance detachment was stopped.

(4) *It may be used in delaying actions*, but again only to a limited extent, on a limited front and at long ranges. It can not delay in successive positions—unless those positions are a considerable distance apart and the unit may not be pinned to the ground by the fire of the enemy—for when it gets out of the trucks it is not equipped to move out on its own power over any considerable distance.

(5) *It can be used as a mobile element of an advance guard, rear guard, flank guard, or outpost.*—(a) *Advance guard.*—It may be attached to the advance guard, and be used by the advanced guard commander either as a pivot of maneuver, as his maneuvering force, or as a part of the advance guard on either of these missions. Or, the commander may decide to send the reconnaissance detachment on another mission and develop the situation with the advance guard, in which case he may direct that elements of the reconnaissance detachment, when passed through by the advance guard, will assemble on a certain road, etc.

(b) *Rear guard.*—In a rear guard action it may be attached to the rear guard command or for such use as he desires to make of it. On the other hand, the reconnaissance detachment and the division cavalry may act as a unit not directly under the rear guard commander.

(c) *Flank guard.*—It may be used as a mobile element of a flank guard. If it appears that the detachment may not be needed elsewhere it may be attached to the flank guard. If a cavalry command is operating for flank protection, it may be attached to the reconnaissance detachment for use as a flank guard.

(d) *Outpost.*—A detachment may be attached to an outpost to give it additional security. Small detachments from the main detachment may be sent out well to the front and flanks, provided they are given the necessary security by the cavalry.

In all of these missions the detachment is an intact mobile reserve in the hands of the commander to be used in accordance with the situation.

(6) *Pursuit.*—It can be used on a pursuit if the situation is such that you can send it to a definite locality as a part of the encircling force. If the enemy is retreating on a very narrow front, a reconnaissance detachment might be able to seize some one or two key positions; but if it is retreating on a broad front, then it would not do much good to send out a reconnaissance detachment on such a mission, except as a part of a larger force.

(7) *Demolition missions.*—There may be situations in which demolitions will become the primary mission of the detachment and in such a case it should be specially organized with a high percentage of demolition detachments—and sufficient other arms to either protect the demolition detachments while they are performing their missions, or, fight to get to the place where the engineers are to do their work.

(8) *As escort.*—It might be used as a part of a special escort for division trains in the event that they could not be protected by the normal line of communication troops. Such a use would be exceptional.

(9) *Reinforce line of communication troops.*—It might be used in a very special situation to reinforce the troops protecting the line of communication; but such a use would also be very exceptional. This use is about the same as above and might well have been combined.

(10) It can be sent forward to *fill a gap* in a line between units in the attack or defense. In such a situation it is simply another case of either defending or attacking on a very limited front.

(11) It is a constant *threat to enemy security detachments* because they will always be exposed to the threat of attack from this unit, either acting alone within the screen of security established by the cavalry, or, in conjunction with the cavalry or other security units. Whatever mission it is sent on remember its limitations and the fact that it must be moved within the zone of security established by the cavalry.

(12) Finally, it may be used for the purpose of a *demonstration or feint* either by itself or in connection with other forces where combat is not involved. For example, if you plan an attack on one flank, you want to make some demonstration on the other. The units of this detachment could be used to make the demonstration, then entruck, and be delivered to their assembly areas in time to take their assigned missions in the attack. Or, in the case of a river crossing such a detachment, if organized, might be sent to make or assist in making a demonstration at some point and then be returned under cover of darkness. Of course the same thing can be done by any motorized unit, but assuming that the reconnaissance detachment is already formed, it may be the logical unit to use.

44. SECURITY AND RECONNAISSANCE ECHELONS.—Thus between the distant reconnaissance of the mechanized and horse cavalry and the close-in local security of the columns, there may be three other detachments with closely related missions.

a. *The division cavalry*—the leading element of reconnaissance and maneuver to clear up the situation and make contact with the enemy.

b. *Foot elements* (as advanced guards) marching, and giving local security to the columns.

c. Foot elements transported in trucks and reinforced by other motorized units, which we call reconnaissance detachments.

The detachment is an intact mobile reserve, whose capabilities for attack or defense are far from negligible, which can be used within the zone of safety established by the first element, the cavalry, or for special missions.

The proper use of each detachment will assist the commander, while his reconnaissance agencies are gaining information, to march his main body for as long a time as possible without deployment, retain his freedom of maneuver, and then when it is established that his security elements are in contact with enemy forces which will force his deployment, to permit his mass to change from a route to a column formation or vice versa without subjecting the troops to the adjusted fire of an enemy before they are in a position to reply.

45. SUMMARY.—Summarizing, we can say that in a march in the presence of an enemy, in order to insure security for the mass of the command up to the time the elements arrive on the battlefield and are disposed for combat we must have:

a. Eyes: Espionage, observation aviation, radio intelligence and mechanized and horse cavalry, all working on a diminishing radii with which we can observe at as great a distance as possible in the directions in which we are interested and which cover the movements of our command by reconnaissance and gain for us necessary information.

b. Arms and legs: In the shape of advance, flank, and rear guards; reconnaissance detachments and other highly mobile units which are sent out in the threatened directions and whose maneuvering and resisting capacity should be in accordance with the enemy capabilities or in proportion to the delay which these security detachments must make.

c. A body or mass which marches under the protection of these other units and whose dispositions should be such that they can be changed quickly in accordance with the information received.

USAGE OF THE TERM POSITION

The term *position* shall be understood to mean the defensive position a unit (brigade, division, or corps) is to organize and is prepared to defend initially, and includes the nose and the organized flank extensions.

The division commander in his decision to defend may give the division *position* by stating that the division will organize and defend a *position*, brigades abreast (or in column), along the general line (see Figure 1): A—B—C—D, or he may state that the division will organize and defend a *position*, brigades abreast (or in column), with the nose along the general line: B—C and flank extensions to vicinity of A and D; either decision is satisfactory. In case the maps available to the commander are not suitable for the selection of the position and reconnaissance for the position has not been made prior to the announcement of the decision, the decision may be limited to the general area or terrain feature to be held, for example, when the general map only is available.

The usage of the term *position* as described above in no way changes the instructions as to the defensive dispositions or conduct of the defense. The term is necessary to facilitate the issuance of orders and is needed particularly in the corps series to designate the *positions* to be organized and defended by the divisions.

In considering an independent division, it should be remembered that any *position* the division may organize and defend initially, except where the flanks are secure, may be enveloped by the enemy. To meet this wide envelopment, the division may be forced to extend the *position*, vacating such parts of the original *position* as the situation dictates.

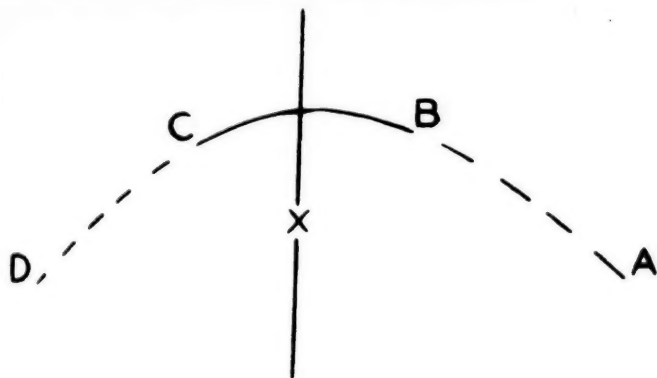


FIGURE 1

COMMAND AND STAFF PROCEDURE TROOP LEADING

CONTENTS

	Paragraphs
CHAPTER I.—General	1-10
II.—The Division Commander and His General Staff in the Attack	11-24

CHAPTER I

General

	Paragraph
Definition and scope	1
Object of instruction in troop leading	2
Processes involved in the control of operations	3
Reconnaissance	4
Plans	5
Orders	6
Visits, conferences, and inspections	7
Use of staff and subordinates	8
Operations of the staff	9
Application of the principles outlined	10

1. DEFINITION AND SCOPE.—Troop leading is the art of leading, fighting, and supplying troops in campaign. In actual practice, troop leading is so broad in scope, is affected by so many intangible factors, and is so closely associated with tactics and logistics, that theoretical instruction in all of its phases manifestly would be impossible. For purposes of study and instruction, therefore, the subject must be narrowed down to such of its phases as can be given concrete consideration.

2. OBJECT OF INSTRUCTION IN TROOP LEADING.—*a.* The object of instruction in troop leading is to consider general guides as to the methods to be employed and the procedure to be followed in the exercise of command in the field; in other words, to teach a uniform technique of the combined functioning of commanders and staffs in the field.

b. Tactical instruction teaches tactical decisions and methods of employment of troops with reference primarily

to formations, dispositions and maneuvers in battle. Instruction in administration and supply covers the requirements and principles of supply and evacuation, and the employment and operation of these administrative and supply facilities.

c. Assuming adequate tactical, technical, and administrative training as a basis, instruction in troop leading attempts to teach how to carry through the execution of tactical and administrative decisions and plans. Specifically, troop leading should teach us:

(1) To visualize more clearly an existing situation and its requirements, to appreciate time and space factors, and to anticipate further requirements.

(2) To appreciate the necessity for rapid and intelligent estimates of situations and prompt decisions by a commander.

(3) To understand better the importance of team-work between commanders, their staffs, subordinate units, and services.

(4) Finally, how to go about the execution of a command task promptly, how to make use of staff officers and subordinate commanders, and how to use available time to the best advantage.

3. PROCESSES INVOLVED IN THE CONTROL OF OPERATIONS.—a. The processes that are essential to the effective control of military operations in the field may be stated as follows:

(1) First, a proper estimate of the situation must be made. This estimate is based upon a consideration of the mission, the terrain, and the situation as to our own and the hostile forces, and is a continuous operation. The commander obtains a correct appreciation of the terrain and of the situation primarily through personal observation and reconnaissance and from reports of staff officers and subordinates.

(2) Second, correct tactical decisions based upon the estimate of the situation, must be made at the proper times. Plans must be developed to carry out the decisions made, and orders must be issued for the execution of these plans.

(3) Third, the execution of the orders issued must be checked and supervised.

b. None of these essential processes can be ignored without endangering the success of the operations being conducted.

c. Some of the activities involved in these processes will be considered in the paragraphs which follow.

4. RECONNAISSANCE.—*a.* Reconnaissance of the terrain prior to the formulation of final plans frequently is essential in order to determine the influence of the terrain upon the proposed operations. Good maps are a help but a conception of the terrain viewed on the ground may materially assist the operation being conducted.

b. In a moving situation, time seldom will permit a division or higher commander to make a complete personal reconnaissance on the ground of even the critical area of combat. In many situations, moreover, such a ground reconnaissance would require an undue exposure of the commander to hostile fire. Frequently, however, time will allow the commander to make an airplane reconnaissance of the critical area in which his major interest lies, and this he should do when he requires specific information that can be obtained from such a reconnaissance. Other necessary reconnaissances must be made either by staff officers or by subordinate commanders. Any reconnaissance made should have the definite purpose of gaining specific information. A general reconnaissance without such a specific objective is time wasted.

5. PLANS.—*a.* (1) Having arrived, by means of his estimate of the situation, at a basic decision as to the line of action to be adopted, the commander must now make additional decisions as to how, in general, he will use his subordinate units to carry out that basic decision. The basic decision together with these additional decisions constitute the commander's plan which is announced as a directive to the staff. This plan is expanded and developed by the staff into a detailed plan which, after final approval by the commander, is announced in orders to the command. The detailed plan must insure the execution and control of the operation as intended by the commander. Such a plan is possible only when the staff officers who prepare it have a correct conception of the commander's ideas. It is therefore essential that the directive contain all deci-

sions of the commander, both tactical and administrative, necessary to convey that concept. Because of the close association of the staff with the commander and the resulting familiarity with his policies and tactical doctrines, a brief general outline of the plan frequently is sufficient for this purpose. In general the amount of detail required in the staff directive will vary inversely as the training and experience of the staff.

(2) Normally, the directive will include the essential elements of enemy information.

b. In order to avoid delays in execution as well as the possibility of being surprised, the commander must look ahead constantly to the next phase of the operation. After acquainting the chief of staff with his plan for the immediate operation, and while the staff is preparing the detailed plans, the commander formulates his plan for the next phase or supervises the execution of important matters already initiated. In formulating tentative plans for succeeding phases of the operations, he often will indicate certain items of enemy information which he will need in this connection.

6. ORDERS.—*a.* In a moving situation, orders will generally be issued fragmentarily and should be issued at the proper moment demanded by the situation. They may be oral or dictated, or may be sent by telephone, or by oral or written message. Complete written field orders, or long dictated orders issued in the presence of all concerned, will generally be issued only in stabilized situations or to confirm fragmentary orders already issued. A commander, having decided upon the eventual employment of his force, usually can determine when and where he will issue his orders (if he is to issue them personally), and may direct such subordinate commanders or their representatives and such members of his staff as may be required, to be present to receive the orders. A subordinate commander should not, however, be taken from the performance of important functions to be present at the issue of orders when those orders can be conveyed to him by a staff officer or other representative, unless there is an urgent reason for his personal presence.

b. In connection with the issue of orders in actual practice in the field or in troop-leading problems, the following points should be borne in mind:

(1) Place yourself in the position of the recipient—what must he know to carry out his part of the operation?

(2) It is better to issue a timely fragmentary order than a complete order too late. But whatever the order is, it must meet fully the existing situation. Numerous supplementary orders tend to undermine confidence.

(3) In certain situations, the issue of warning orders will save much time for subordinates.

(4) A constant effort must be made to reduce the time for the issue and transmittal of orders. Subordinates must not be handicapped by a commander's delay but must be assured of sufficient time for the issue and transmittal of their own orders and those of their subordinates.

(5) Orders should always follow the chain of command; in rare instances when this is impracticable, the commander unavoidably passed over should be notified of such orders at the earliest possible moment.

7. VISITS, CONFERENCES, AND INSPECTIONS.—*a.* By means of visits to his subordinates, conferences with them, and observation of the command, the commander insures that contact with his subordinates and troops which is essential to effective leadership.

b. An important factor entering into the commander's estimate of the situation is the state of his command, that is, the physical condition and morale of the troops and the status of rations, other supply, and equipment. It is desirable that the commander have first-hand knowledge of this factor gained by personal observation and conferences with individual commanders. In this way, the commander is enabled not only to evaluate correctly this factor in his estimate, but also to see that necessary measures are taken to improve the state of the command. Thus, by constant personal attention to the comfort and general welfare of the troops at all times, the commander improves their morale and promotes their loyalty to him. If through frequent visits to the troops and personal contacts with his subordinates, the commander has built up their confidence in him and in the command as a whole, his presence now (just prior to combat) will serve to prepare the command spiritually and mentally for battle, inspiring in them the will to win.

c. The execution of orders must be supervised vigilantly, not only to insure a correct understanding of the orders

by subordinates, but also to smooth out conflicts or difficulties which may arise and, sometimes, to insure full compliance. This supervision is carried out by inspections, and by visits to and conferences with subordinates, either by the commander in person or by members of his staff. In general, the more imperfect the state of training of the subordinates, the more important is this command function.

d. Before proceeding on his visits, the commander should prepare and leave at his command post an itinerary showing the route to be taken, the points to be visited, the time of departure and return, and the approximate time he expects to be at certain places. This is essential to insure that all necessary points and activities will be included, that the necessary movements may be made without loss of time, and that the chief of staff and others may know where to find the commander in case a need arises to get in touch with him.

8. USE OF STAFF AND SUBORDINATES.—*a.* No matter what a commander's capacity for work may be, neither his capacity nor the time available will permit him to do all that he may want to do. Consequently, he must relieve himself of everything which he can properly delegate to his staff or subordinates in order that he may concentrate his own attention on the more important matters. The degree to which such decentralization is carried will vary, of course, with each commander and his confidence in his staff and subordinates. All important decisions must be made by the commander whereas many minor decisions as to details should properly be left to the staff. For the corps or division commander, a good guide is for the commander to confine himself to the formulation of policies and directives (the commander's plans—see paragraph 5); to the issue of important parts of orders in rare cases; to the reconnaissance of vital areas, usually by airplane; and to visits and inspections for the purpose of determining the state of the command, preparing the troops mentally for battle, and supervising the principal phases of execution. In lower echelons less decentralization will be the rule. For example, regimental and lower commanders habitually will issue their own orders.

b. In preparing his plan, the commander ordinarily requires the staff to furnish him any detailed data needed.

He may even require the staff to prepare tentative plans for his consideration. He consults with members of his staff as necessary. For example, he usually consults with the artillery commander relative to the use of the artillery. Ordinarily this plan is prepared in conference with the chief of staff, in order that the commander may avail himself of the opinions and advice of the chief of staff, and in order that the chief of staff may have a clear conception of the commander's intentions. The chief of staff usually announces the commander's plan to the staff, either in a staff conference or by fragmentary instructions to individual members of the staff. The commander may desire to issue his directive to the staff in person. This will depend largely on the personality of the commander and the possibility of readily assembling the staff for the conference. This method may be particularly applicable in cases where an unexpected situation arises making it necessary for the commander quickly to get the latest information from the staff, formulate a decision and plan, and initiate instant execution.

c. On his visits and inspections the commander requires some member or members of his staff to accompany him to make notes of instructions given, or to render such other assistance as he may desire. Frequently he uses one or more of his aides for this purpose. In rare cases the commander may require G-3 to accompany him, but ordinarily the volume and importance of the work of the G-3 section will be such as to make this undesirable. Members of the G-3 section, however, frequently visit subordinate units to deliver orders to them, to supervise and check the execution of orders, and to obtain information as to the disposition of troops. The chief of staff habitually remains at the command post during the commander's absence, acting for the commander and coordinating the work of the staff.

9. OPERATIONS OF THE STAFF.—In view of the many, and frequently conflicting, demands on the capacity and time of the commander and his staff in the control of operations, the necessity for precise team-work within the staff is obvious. A satisfactory degree of coordination which will make this team-work possible requires, on the part of each individual team member, a thorough understanding of his own job, a comprehensive knowledge of the working of the other staff sections and the staff as a whole, and the ability

to work methodically in accordance with a definite sequence of tasks and in complete cooperation with others. In any given situation it is of first importance that a staff officer be able to determine quickly the matters that must be accomplished, the sequence in which they should be accomplished, and the methods by which they may be accomplished.

10. APPLICATION OF THE PRINCIPLES OUTLINED.—Chapter II discusses in more detail, the functioning of the commander and his staff in an attack situation. It is presented to illustrate how the principles which have been discussed may be applied to a particular type of operation. It is, however, only a general guide to the functioning of the commander and his staff in a particular situation. Different situations will vary as to time, place, location and condition of troops, terrain, weather, and enemy activities; the detailed application of the principles of command and staff procedure will vary accordingly. Likewise, in other types of operations varying considerations will be encountered. The principles heretofore outlined and the illustrative discussion serve, however, to indicate the considerations which determine the functioning of the commander and his staff.

CHAPTER II

The Division Commander and His General Staff
in the Attack

SECTION I.—The Development for Attack	11-17
II.—The Attack	18-24

SECTION I

The Development for Attack

	Paragraph
General	11
The division commander	12
The chief of staff	13
G-3	14
G-2	15
G-4	16
G-1	17

11. GENERAL.—*a.* This section will be devoted to the discussion of a troop-leading procedure for the division commander, the chief of staff and the chiefs of the general staff sections, during the development for attack, with particular reference to the matters which each of these officers should accomplish during this period. The discussion is limited to the period beginning when the division commander, having made his basic decision to attack, formulates his plan for the development of the division, and ending when the division commander completes his plan for the attack.

b. This discussion is based on a situation in which the division in march gains contact with a hostile force and the division commander makes his basic decision to attack as soon as the available information fixes the enemy in a definite locality, even though only the advanced elements of the opposing forces are engaged.

c. The usual procedure in the development of the division commander's plan for the attack is set forth in the succeeding paragraphs of this section. It will be noted that

this procedure contemplates a progressive development of this plan, beginning with a basic decision, followed by a plan for the development of the division and later, when more information of the enemy is available, by the complete plan of attack. This is not to be regarded as the only procedure. There may be occasions when the division commander will attach such importance to the attainment of surprise by rapidity in launching the attack, that he will be willing to base his plan of attack on very meager information of the enemy in order to launch the attack at the earliest possible moment. In such a case the division commander may formulate his complete plan of attack, including instructions for the development, immediately following his basic decision and based on the information then at hand. This would combine the commander's plan of development, and plan of attack into one plan and would eliminate the necessity of the second staff conference discussed in paragraph 20 *b*, Section II. On being acquainted with this plan of the division commander, the staff, after issuing orders for the development of the division and warning orders for the attack, would proceed immediately with the preparation of the detailed plan of attack. The division commander may require tentative plans prepared, after the detailed plan for the attack is completed, to meet developments in the situation which may affect the execution of the plan that has been determined upon.

12. THE DIVISION COMMANDER.—*a. Plan for the development.*—(1) The division commander's first concern, after making his basic decision to attack, is to formulate his plan for and begin the execution of the development. In the situation contemplated in this discussion, he does not, at this time, have sufficient information on which to base his complete plan for the attack: therefore the plan of development must be based on the commander's plan of attack in its present incomplete state. He will need more information of the terrain and of the dispositions of the enemy, such as the location of hostile flanks, artillery positions, and reserves, before deciding upon certain features of his plan of attack. This additional information will be obtained during the development phase by employing a part of the division to drive in the hostile covering forces and

develop the enemy's position, by intensifying reconnaissance by all reconnaissance agencies, and by the personal reconnaissance of the division commander, or members of his staff, and subordinate commanders. The information now available, however, will permit the commander to develop the command, at least partially, and then to start the staff working on tentative plans for the attack. (See paragraph 11 c.)

(2) The commander's plan for the development usually includes general provisions for the assembly of columns in the areas desired; instructions for the preliminary action of driving in the hostile covering forces and developing the hostile position, including the portion of the command to be employed in this operation; such provisions of the proposed plan of attack as have been decided upon at this time, including the general organization of the command for attack; and the other instructions, tactical or administrative, which the commander considers desirable to announce at this time. The commander's procedure in formulating this plan is given in paragraph 8 b, Section I.

(3) Having acquainted the chief of staff with his plan, the division commander leaves to his staff the preparation of the detailed plans and the issuance of the necessary orders. It will generally be impracticable to have subordinate commanders assemble to receive orders in a situation of this kind, since this would take these commanders away from important duties with their commands and the orders can be delivered to them just as well by staff officers.

b. Visits, conferences, reconnaissance.—(1) It usually requires several hours for the preliminary operation of driving in the hostile covering forces and securing sufficient information of the hostile position to furnish a basis for the division commander's complete plan of attack. Thus, after completing his plan for the development, the division commander may have several hours in which to exercise other important command functions before he can complete his plan for the attack. He can use this time most profitably for the purpose of visits to and conferences with his subordinate commanders, and for the purpose of reconnaissance. He can observe the troops in march, but his visits to the troops will be limited at this time because the troops will

not complete their assembly until the latter part of the development period, if that early.

(2) One of the brigade commanders ordinarily is charged with the preliminary operation of driving in the hostile covering forces and developing the enemy's position. The division commander may wish to visit this brigade commander early, in order to see that the brigade commander understands clearly what he is to do in this operation and to discuss plans for the use of his brigade in the attack. The division commander would like to witness a part of this preliminary action, if practicable, from a place affording a good view, and in the presence of the brigade commander so that the two may discuss the action together.

(3) The other brigade commander ordinarily is charged with making the main attack, and, during this period, his brigade will be moving into its assembly area. The division commander may wish to visit this brigade commander to see that he understands and is correctly executing the plan of development; and to discuss plans for the attack.

(4) The division commander may also desire to visit the commander of the cavalry, to discuss the employment of the cavalry both in the development and in the attack. At times, however, the location of the cavalry commander will be such that time will not permit a visit to him.

(5) If time is available, the division commander should make an airplane reconnaissance of the area contemplated for the main attack before completing his plan for the attack. This reconnaissance should be planned to secure specific information, such as the availability of cover, the presence of obstacles, and such matters. A ground reconnaissance of this area is usually out of the question, particularly in the case of a wide envelopment, on account of lack of time. Furthermore, a ground reconnaissance of the area of the main attack might entail an unwarranted exposure of the division commander to hostile fire.

(6) The itinerary which the division commander should prepare is discussed in the preceding chapter. The division commander usually will need only an aide to assist in preparing this itinerary.

(7) In a situation of this kind the division commander needs only one aide to accompany him. The work of the

staff will be particularly heavy at this time owing to the necessity of getting the orders for the development into the hands of the troops at the earliest possible time. He should, therefore, release the other two aides to the chief of staff before leaving the command post.

(8) During his visits the division commander will be out of touch with the situation at a whole. This situation is kept up to date at the command post from incoming reports. He therefore directs the chief of staff to furnish him a summary of changes in the situation at some convenient place included in his itinerary. On his return to the command post he must promptly bring himself abreast of the situation by the study of staff reports and estimates.

c. Plan for the attack.—(1) The division commander's plan, or directive, for the attack must be made known to the staff in sufficient time to permit the timely preparation and issuance of orders. Time will be pressing. Even when the attack is to be a wide envelopment launched the following day, orders for any movement of the enveloping force during darkness must be issued far enough in advance to permit the necessary daylight reconnaissance and marking of routes before darkness sets in.

(2) To assist him in the formulation of his plan and thus expedite its completion, the division commander usually requires the staff to prepare during his absence on visits and reconnaissance, tentative plans for the attack for use as a working basis in completing his plan. If one of these tentative plans agrees with his own estimate and the knowledge gained from his conference with subordinates and from his reconnaissance, he may adopt it with or without modification, as his plan and order it put into effect.

13. THE CHIEF OF STAFF.—*a. General.*—The general functions and duties of the chief of staff are given in Chapter II, *Command, Staff, and Logistics*, C. & G.S.S., 1936. The chief of staff keeps himself informed as to the commander's intentions and wishes, in order that he may direct and coordinate the efforts of the staff along proper lines. He should approve all orders prepared by the staff before they are issued to insure coordination and to be certain that the commander's intentions are being fully carried out. He should keep higher headquarters informed as to the situation and as to the plans of the division commander.

b. Staff conference.—The chief of staff holds staff conferences whenever necessary to direct and coordinate the work of the staff. Having received the division commander's plan for the development, the chief of staff usually calls a conference of the general staff and such special staff officers as are immediately available at the command post for the purpose of announcing this plan and of answering any questions asked. In the situation being considered it is probably not essential that G-1, G-4, and the special staff be present and the conference would not be delayed while assembling them. As a minimum, G-2 and G-3 must be immediately informed. It is desirable but not essential that the commander of the artillery be present. The chief of staff notifies any of the officers not present at the conference of matters immediately pertaining to them. At this time he gives necessary instructions with respect to the preparation and issue of orders for the development and the preparation of tentative plans for the attack, including plans for any movement of the enveloping force to be made under division control. Such additional instructions as may be required should be given to the staff at this time. The assembling of the necessary officers for this conference is desirable in that it facilitates mutual understanding. However, it is not the only method of accomplishing the same results. In a rapidly developing situation where time is pressing, it may be better to transmit the directive fragmentarily to the staff sections in the essential order of priority.

c. Supervision of preparation of plans and orders.—

(1) The chief of staff supervises and coordinates the work of the staff in preparing orders for the development and tentative plans for the attack, making such supplementary decisions as may be necessary. In the exercise of this function he consults various members of the general and special staff from time to time. He checks the tentative plans for the attack prepared by the staff and will be prepared to present them to the division commander. He gives such instructions to the staff as are necessary to insure the inclusion of any desired features in these plans.

(2) The chief of staff ordinarily does not require the assistance of the available aides in the exercise of these

functions. Therefore, he usually releases to G-3 any aides who may have reported to him. G-3 will have need for additional assistants to deliver orders to subordinate units.

d. Estimate of situation.—The chief of staff must study carefully the reports received, keeping the estimate of the situation up to date. This is particularly important during the absence of the division commander in order that the chief of staff may orient quickly the division commander on his return. If the division commander so directs, the chief of staff furnishes him a summary of the situation by telephone or by messenger during his absence from the command post.

e. Plan for the attack.—The chief of staff presents to the division commander tentative plans and other data prepared by the staff for consideration by the division commander in preparing his plan, or directive, for the attack. In conference with the division commander, the chief of staff discusses these plans and receives from the division commander his plan for the attack.

14. G-3.—*a. General.*—The general duties of G-3, as the head of the Operations and Training Section, are given in Chapter II, *Command, Staff, and Logistics*, C. & G.S.S., 1936. To assist him in the performance of his duties, G-3 normally has three commissioned assistants, a major and two lieutenants. The major ordinarily is the executive officer of the section and is in general charge of office administration, including the routine preparations of orders, messages, reports, journal, and diary. Both lieutenants are general office assistants but are also trained for use as outside assistants. One lieutenant is especially trained for work on troop movements. In addition to these regular assistants, quite frequently in a situation of the kind we are discussing, one or two of the division commander's aides are attached to this section.

b. Orders for the development.—(1) As previously indicated, G-3 usually receives the commander's plan for the development, together with such additional instructions of the chief of staff as may be necessary, at the staff conference. It then becomes the immediate task of G-3 to prepare the necessary orders to put this plan into effect, and, after their approval by the chief of staff, to dispatch these orders to the

troops. This must be accomplished with the least practicable delay in order to avoid the possible engagement of units by column commanders in a manner contrary to the division commander's plan, and to prevent the countermarching of units in order to assemble in their proper areas. Accordingly, G-3 should promptly explain the commander's plan to his assistants and start them to work immediately on the preparation of these orders. G-3 should supervise and direct this work, consulting with other staff sections as necessary in the interest of coordination.

(2) These orders preferably should be delivered to subordinate commanders by officers who can explain the situation and check to see that the orders are properly understood. For this purpose, G-3 may employ such aides as may have been placed at his disposal, in order to retain at the command post as many of his regular assistants as possible for more important work.

c. Plans for the attack.—(1) When the orders for the development have been dispatched, G-3 proceeds with the preparations of tentative plans for the attack. These tentative plans, as submitted to the chief of staff, are intended primarily as a working basis for the division commander in preparing his plan of attack, hence, they should be prepared in broad outline covering such matters as the commander might include in his plan. Usually more than one such plan will be prepared in order to meet different possible developments of the situation. Final plans cannot be prepared until the division commander has acted on the tentative plans and his directive is announced. However, G-3 should foresee the possible approval of one of the tentative plans and should block out the additional details that would be required to put the plans into effect. He may block out the necessary warning orders. Thus, when the commander's directive is received, the necessary orders can be prepared and issued in a minimum of time. G-3 should prepare and have available to submit to the division commander such time and space factors or other data relative to the tentative plans as he anticipates the division commander may desire to consider.

(2) When the attack is to be a wide envelopment and a night movement of the enveloping force is to be made

under division control, orders for such movement must be issued well before dark, for reasons stated in paragraph 12 c. While the final orders for the movement cannot be prepared until the commander's plan for the attack is announced and the locations are known of all units of the enveloping force in their initial assembly areas, much preliminary work can be done prior to that time. For example, time and space factors may be assembled, tentative routes selected, and a tentative march table blocked out.

d. Coordination with other staff sections.—In the preparation of orders for the development and tentative plans for the attack, G-3 consults other general staff sections for purposes of coordination. He also should confer with various special staff officers, or their representatives, in order to inform them as to the plan for the employment of their units or activities and to avail himself of their specialized professional knowledge. For example, he should confer with S-3 of the artillery brigade with regard to the details of employment of the artillery in the development and the attack; the signal officer, relative to communications and the location of command posts; G-4, with regard to transportation for tactical purposes; and others, as the situation may require. In the event of a conflict between the plans of the G-3 Section and those of any other general staff section, that cannot be settled in conference, G-3 refers the matter to the chief of staff for decision. G-3 also consults the chief of staff whenever necessary to insure that the plans being developed are progressing along the proper lines.

e. Progress of the development.—Through the study of reports received from combat units and other staff officers, G-3 keeps himself fully informed as to the progress of the development, particularly with regard to the progress of the preliminary action of driving in the hostile covering forces and developing the hostile position. G-3 rarely will have time during this period to make staff visits. He must be prepared to render a G-3 estimate whenever one may be required by the chief of staff or the division commander.

15. G-2.—*a. General.*—The general duties of G-2 as head of the intelligence section are given in Chapter II, *Command, Staff, and Logistics*, C. & G.S.S., 1936. To assist him in

the performance of his duties, G-2 normally has two commissioned assistants: one captain and one lieutenant. The captain acts as principal assistant and understudy to G-2. Normally the captain is charged with keeping the intelligence map and does the detailed work in preparation of the G-2 plan and the G-2 annex when the latter is issued. The lieutenant supervises the routine office operations of the enlisted office personnel, such as preparation of original drafts of situation overlays, posting the journal and work sheet, chart of identifications, and writing up G-2 reports and estimates outlined to him by G-2. There is, however, no hard and fast demarcation of duties between the officers of the section. All work together and are at all times prepared to perform any of the functions of the section. This facilitates the arrangement of reliefs, which must be provided for because the work of the section is continuous.

b. Staff conference.—As previously indicated (paragraph 13 b), G-2 usually receives the commander's basic decision to attack and the plan for development, together with any additional instructions for the operation, from the chief of staff in a staff conference immediately after the formulation of such decision and plan. Having anticipated in his study of the situation the changes or additions required in the essential elements of enemy information in case of a decision to attack, G-2 presents his recommendations as to such changes or additions for the approval of the chief of staff at this conference. These essential elements cover such required enemy information as is referred to in paragraph 12 a (1), above. It is extremely important that G-2 anticipate any changes required in the essential elements *before* attending the staff conference, since at this stage in the operation the time element is particularly pressing.

At this meeting G-2 should ascertain from the chief of staff the time element involved in the next phase of the operation in order that he may make arrangements in his plan to secure the desired information from his collecting agencies at the time or times required. He should inquire of the chief of staff the times at which the commander wishes to have reports on the situation and the approximate time when he expects to make his final decision concerning the attack.

c. Formulation of G-2 Plan for collection of information.—After the conclusion of the staff conference, G-2 returns to his staff section. He informs his assistants of the commanders's decision and plan for development and of the essential elements of enemy information announced by the chief of staff for the period up to the time the commander will make his final decisions for the attack. Based upon these essential elements, the enemy situation as now known, and the time at which answers to the various essential elements must be procured for the commander, the section immediately formulates the G-2 Plan for the collection of enemy information. The work usually is done by G-2 and his senior assistant. Certain parts of the work, such as the analysis of the essential elements, may require G-2's personal attention; depending upon the experience of the senior assistant, varying amounts of the detailed working out of the plan should be done by the assistant. Often only a revision of a plan already in operation will be required. At a minimum, a careful check of the existing plans should be made. The G-2 section keeps itself informed at all times as to the varying capabilities of our own reconnaissance agencies.

d. Coordination.—(1) As work on the G-2 plan proceeds, it may develop that new or altered missions are desirable or necessary for collecting agencies, such as the cavalry, infantry forces in contact, or other tactical units. G-2 then coordinates these missions with G-3 and such special staff officers as may be concerned. If no conflict with other missions develops, G-2 procures the immediate issuance by G-3 of fragmentary orders to the agency concerned, except in the case of orders to the air service. G-2 is responsible for the coordination of G-2 and G-3 missions for the air service. At all times G-2 and the air officer work together. G-2 keeps the air officer constantly informed of probable requirements for missions as far ahead as they can be foreseen and transmits orders to him directly for missions decided upon either by his own section or for G-3. The air officer must be in constant touch with G-2 keeping him informed of the status of his units and that information procured is promptly given to the G-2 section. Close cooperation often eliminates the necessity for G-2 to formulate formal orders to the air service. By discussing the

missions with G-2 as they are determined while drawing up the plan, the air officer, himself, can formulate the orders in terms best suited to procure the desired results.

(2) Coordination with G-1 is also important in order to have an understanding as to the handling of prisoners so that prompt examination may be made by G-2 or his assistants.

e. Study and dissemination of information.—(1) During this period there will be information coming into the section which must have immediate consideration. For this reason the assistants must carry out as many details of the section work as possible in order that G-2 can at all times give priority to the study of incoming information. As this information comes in, G-2 keeps a constant running estimate of the enemy situation. He prepares himself particularly to give an intelligent estimate at the time the commander wishes to make his final decision for the attack.

(2) As information is received, G-2, as a part of his study, determines what items must be immediately disseminated. In particular, he should be prepared to give the chief of staff an informal estimate whenever called for, and keeps the chief of staff informed of all new information of importance. He should see that all pertinent information is promptly disseminated to higher, lower and adjacent units concerned.

(3) The plan of collection of information throughout this phase of the operation is directed toward giving as complete and accurate an estimate of the enemy situation as possible to the commander at the time he makes his final decisions for the attack (usually when he returns to the command post). On the commander's return, the chief of staff usually has G-2 give the estimate to the commander in person. Often the commander will visit the section at this time and be given the estimate by reference to the G-2 situation map.

f. Personal reconnaissance.—During this phase of the action G-2 ordinarily is fully occupied at the command post. This is a period of intense activity of the section. G-2 can perform his functions at the center of the net of information collecting agencies much better, during this period, than by going out personally on reconnaissance on the doubtful

chance of securing some single item of information. His principal effectiveness at this time is to correlate the many items of information as they are received from the several sources utilized.

g. Liaison.—For the reasons stated above, G-2 himself ordinarily will not be able to visit lower units during this phase. At times it may be advisable to send one of his assistants to the headquarters of a lower unit in order to procure some needed information or to assure the required flow of information. It may, at times, be particularly advantageous to have a member of the G-2 section at the airdrome of the attached observation squadron in order to interrogate observers on their return from important missions.

16. G-4.—*a. General.*—The general duties of G-4, or the head of the Supply Section of the General Staff, are given in Chapter II, *Command, Staff, and Logistics*, C. & G.S.S., 1936. G-4 has a commissioned assistant, who is trained especially in details connected with transportation. This assistant is in general charge of office administration, including the routine preparation of orders, messages, reports, journal, and diary. He keeps the G-4 Situation Map, and acts as chief of section during the absence of G-4.

b. The commander's decision.—To assist the division commander in his estimate of the situation, G-4 should be prepared, on call, to furnish information on the supply, transportation and evacuation situation. This information may frequently be in the form of a G-4 Estimate of the Situation.

c. Orders for the development.—(1) At the conference held by the division commander or the chief of staff, G-4 may or may not be present. He keeps informed of the situation, and secures the approval of the chief of staff on such general recommendations with reference to supply and evacuation as he can make at this time and arranges with the chief of staff for any requests it may be necessary to make on higher echelons of supply.

(2) Following the conference, G-4 confers with other members of the general staff, G-3 in particular, receiving such additional information as is available at this time including tentative detailed plans for the development, and possible general plans for an attack.

(3) G-4 may find it necessary to issue certain fragmentary administrative instructions at this time to carry out the directive of the chief of staff. However, a staff conference with the special staff usually will not be called until a definite plan of action has been adopted and announced by the commander.

d. Conferences and reconnaissance.—(1) If a special staff conference is held, G-4 informs the special staff of the tactical situation; the tentative plan of the commander; such additional instructions as were given by the chief of staff; and any possible plans for future operations. He then receives such recommendations the special staff officers may be able to make at this time with reference to the employment of their services; issues such administrative instructions as are necessary for the direction and coordination of supply and evacuation; and arranges for a future conference with those special staff officers concerned after they have had an opportunity to make the necessary reconnaissances.

(2) During this development phase, G-4 supplements his map reconnaissance with such general ground reconnaissance as is necessary and the situation permits. Before leaving the command post, G-4 ascertains from the chief of staff if the commander will need him during the formulation of the attack plan. G-4 keeps in close touch with his office, and with G-3, either personally or through his assistant, while G-3 is making his tentative general plans for the attack. During this time G-4 also confers with G-1 and the commander of troops designated to protect the lines of communication.

17. G-1.—*a. General.*—The general duties of G-1, or head of the Personnel Section of the General Staff, are given in Chapter II, *Command, Staff, and Logistics*, C. & G.S.S., 1936. G-1 has no commissioned assistant. A master sergeant is assigned to the section as chief clerk to handle office routine and keep section reports up to date.

b. The commander's decision.—To assist the commander in his estimate of the situation, G-1 should be prepared, on call, to furnish information on all matters affecting military personnel as individuals, the state of morale, and

the situation with respect to civilian population within the combat area.

c. Orders for the development.—(1) At the conference held by the division commander or the chief of staff, G-1 may or may not be present. He keeps informed of the situation, secures the approval of the chief of staff on general recommendations with reference to personnel, headquarters arrangements, and civilian population as he can make at this time.

(2) Following the conference, G-1 confers with other members of the general staff, receiving such additional information as is available at this time, including tentative detailed plans for the envelopment and possible general plans for the attack.

(3) G-1 may find it necessary to issue certain fragmentary instructions at this time to carry out the directive of the chief of staff. A special staff conference may be called to issue such instructions. If so, G-1 arranges with G-4 as to the time and place. Usually such a conference will not be called until a definite plan of action has been announced by the commander.

d. Conference and reconnaissance.—(1) If a special staff conference is held G-4 informs the special staff of the tactical situation; the tentative plan of the commander; such additional instructions as were given by the chief of staff; and any possible plans for future operations. G-4 receives the recommendations of the special staff in reference to supply and evacuation. G-1 then issues such instructions as are required and receives such recommendations the special staff officers may be able to make at this time and arranges with G-4 for a future conference with those special staff officers concerned after they have had an opportunity to make the necessary reconnaissances.

(2) During this development phase, G-1 supplements his map reconnaissance with such general ground reconnaissance as conditions warrant in order to pass judgment on the recommendations of the special staff, to check the headquarters arrangements and to contact the civil authorities in the area if the situation so requires.

SECTION II

The Attack

	Paragraph
General	18
The division commander	19
The chief of staff	20
G-3	21
G-2	22
G-4	23
G-1	24

18. GENERAL—*a.* This section deals with the troop-leading procedure for the division commander, the chief of staff and the chiefs of the general staff sections during the period from the time that the division commander announces his complete plan for the attack until orders for the attack are issued. The discussion is a continuation of that contained in the preceding section and is based on the same type of open-warfare situation.

b. It will be noted that the procedure during this phase is generally similar to that discussed in Section I, but that the specific matters with which the respective officers are concerned are different from those discussed in Section I.

19. THE DIVISION COMMANDER.—*a. Plan for the attack.*
—We have seen how the division commander's plan for the attack is built up during the development phase. The completed plan usually will include, in addition to the basic decision, the composition of the forces of the main and holding attacks; the general direction or the objective of the main attack; the composition and location of the division reserve; the general mission of the artillery; the general mission of the cavalry, including when appropriate, the screening or protection of movements and reconnaissances of other elements preliminary to the attack; any instructions as to special measures for deception, or other instructions, tactical or administrative, which the commander considers vital to the success of his plan.

b. Visits, inspections, reconnaissance.—(1) Having completed the formulation of his plan in conference with the chief of staff, the division commander is free to make such visits, inspections and reconnaissances as he considers necessary in furtherance of his command functions. His

presence at the command post will not be required for some time. His staff can be depended upon to prepare the details of the plan of attack and to issue the required warning and fragmentary orders.

(2) If the division commander has made a reconnaissance by air during the development phase it ordinarily will not be necessary to make another such reconnaissance. If no such reconnaissance has been made during the development phase it frequently will be desirable for the division commander to make one at this time.

(3) In some cases the division commander may make a limited ground reconnaissance at this time. If he makes any reconnaissance, its purpose will be to confirm some decision pertaining to his announced plan, or to secure information on which to base plans for future operations; that is, plans relating to the conduct of the attack, or plans for use in the event of success or failure of the attack.

(4) A large part of the troops are at this time in their initial assembly areas and some are engaged in developing the enemy situation. This is a favorable time for the division commander to visit as many battalions as time will permit to gain a first-hand knowledge of the condition of the troops and to prepare them mentally for battle.

(5) Subordinate commanders will be receiving fragmentary orders for the attack, issued by the division staff. These orders are, of course, in addition to those issued during the development phase. Accordingly, the division commander should visit the brigade commanders in order to discuss with them his plan and to insure that they understand correctly what is to be done, and also to determine the state of their commands. He may also visit the cavalry commander, but often this will not be practicable owing to the location of the cavalry. He ordinarily consults the artillery commander prior to the formulation of his plan for the attack. Further consultation with this commander may not be necessary since the artillery brigade command post is with the division command post and contact between the artillery brigade staff and the division staff should insure proper coordination of artillery support for the attack.

(6) As in the development phase, the division commander normally requires only one of his aides to accom-

pany him and can release the other aides to the chief of staff.

(7) The statement relative to the preparation of the commander's itinerary, contained in paragraph 12 *b* (6), applies equally here.

c. After return to the division command post.—On returning to his command post, the division commander usually examines reports received and orders issued and discusses the situation with the chief of staff. If there is sufficient time before the attack is to be launched, as when the attack is to be made the following day, the division commander should examine the detailed plan prepared by the staff, approve it or alter it as necessary while there is still time to make changes. If the attack is to be made without delay, the commander probably would not have time to return to his command post to check the detailed plan and this plan would be acted upon only by the chief of staff. Operations would be initiated on fragmentary orders only and the complete written order might not be prepared until the attack is well under way. The commander should take advantage of any available time for rest, and for further study of the situation and a consideration of future eventualities.

20. THE CHIEF OF STAFF.—*a. General.*—The general duties of the chief of staff are covered in paragraph 13 *a*.

b. Staff conference.—Upon receipt of the division commander's plan for the attack, the chief of staff holds a staff conference at which he announces and explains the plan and answer questions concerning it. He directs that warning orders be prepared immediately and states a time when the detailed section plans (those of G-1, G-2, G-3, and G-4) must be completed. The general staff and such special staff officers as are immediately available should attend this conference. As was the case with the staff conference described in paragraph 13 *b*, it is desirable to assemble the officers needed. However, it is not absolutely essential as the information can be transmitted fragmentarily if necessary.

c. After the staff conference.—(1) He acts for the division commander during the latter's absence. Following the staff conference, he studies reports as they come in and keeps the estimate of the situation up to date.

(2) He supervises and coordinates the work of the staff in the preparation of the detailed section plans, conferring with various general and special staff officers and

making supplementary decisions as necessary. He checks and coordinates the detailed section plans when they are finally submitted.

(3) If any aides have been placed at the disposal of the chief of staff, he releases them to the general staff sections in accordance with their needs for assistance.

(4) When the division commander returns to the command post, the chief of staff discusses the situation with him. If time permits, he should submit the complete detailed plan for the attack to the division commander, receiving the commander's comments or approval of the plan (see paragraph 19 c). If the commander desires any change in the plan, the chief of staff has the change put into effect. When the plan is in final form, the chief of staff directs G-3 to prepare the complete written field order for the attack, and G-4 the complete written administrative order, if one is to be issued. The chief of staff should check and approve those orders when they are completed.

21. G-3.—*a. General.*—(1) The statements in paragraph 14 *a* relative to the general duties of G-3 and the organization of his staff section are also applicable here.

(2) It should be borne in mind that the commander's plan for the attack as announced by the chief of staff is not entirely new to G-3. The commander may have approved one of the tentative plans submitted by G-3 with very slight modifications, if any. We have seen that G-3 has anticipated such an eventuality and already has blocked out the detailed plan, and perhaps the fragmentary orders, necessary to put these tentative plans into effect. Thus, there may be little work remaining to be done by the G-3 section in preparing the detailed plan for the attack and the necessary fragmentary orders to which reference is made in the following paragraphs.

b. Plan explained to assistants.—Having attended the staff conference, where he became acquainted with the commander's plan for the attack, G-3 explains this plan to his assistants and indicate the manner in which the detailed tactical plan is to be prepared and the time it must be completed. If any aides have been turned over to G-3, he may keep them directly under his own control or place them at the disposal of his assistants.

c. Warning and fragmentary orders.—Warning orders must go out at once in order that subordinate commanders may initiate reconnaissance and other preparations without delay. Fragmentary orders are issued from time to time as the detailed plan is developed. Frequently G-3 will charge his major assistant with the preparation and issue of these orders.

d. Movement of part of command under division control.—(1) If the plan for the attack is such that a large part of the command is to execute a movement under division control prior to the attack, it will be necessary for G-3 to issue a march table. In order to acquire the necessary data for this table, G-3 must know the detailed locations of the various elements which are to participate in the movement. The two lieutenant assistants (trained for outside work as well as office work) normally are assigned the task of obtaining these locations. These assistants, while visiting the units concerned (to get detailed locations), should also explain the division commander's plan to the commanders of these units. Ordinarily, G-3 will outline the serials and routes for the march table and then direct one of his assistants to prepare the detailed table. G-3 should see that this march table is carefully checked with the G-4 Plan, and that serial commanders are notified as early as practicable in order that they may initiate the necessary preparations.

(2) The routes for the movement should be thoroughly reconnoitered and marked. G-3 directs the division engineer (after approval by chief of staff) to perform this duty. In order that the division commander and his staff may be informed as to the progress of the march, G-3 arranges to have one of his representatives (lieutenant assistants, aides) join each serial to observe the conduct of the march and to make frequent reports.

e. Coordination with other staff sections.—The activities of G-3 under this heading are entirely similar in purpose and scope to those discussed in paragraph 14 *d*, and need no further discussion here.

f. Complete section plan and the attack order.—When the G-3 section plan is completed, it is submitted to the chief of staff for approval. If the chief of staff makes any necessary changes, G-3 must then consult other members of the general staff and special staff officers for adjustments made

necessary by these changes. It is then the duty of G-3 to supervise the preparation of the complete written field order for the attack. When this order is prepared he submits it to the chief of staff for approval.

22. G-2.—*a. General.*—The statements in paragraph 15 *a* relative to the general duties of G-2 and the organization of his staff section also are applicable here.

b. Staff conference.—Immediately after the commander forms his plan for the attack, G-2 attends the staff conference at which the plan is announced by the chief of staff. At this conference G-2 again obtains the essential elements of enemy information for the phase including the launching of the attack. Knowing the situation up to this time and the tentative plans of attack being considered prior to the final decision by the commander, G-2 goes to the staff conference prepared to make recommendations concerning changes if any in existing essential elements which may be caused by any given plan of attack. He is, therefore, able to propose such changes or additions without delay at this staff meeting. He also ascertains the time at which various steps in the preparation for the attack, and the attack itself, will occur.

c. Revision of the G-2 Plan.—(1) Immediately after the staff conference where he obtained the outline of the final plan of attack and the essential elements of enemy information for the coming phase of operations, G-2 returns to his staff section. He orients his assistants on the matters determined at the staff conference.

(2) It is the next concern of G-2 to revise the G-2 Plan for collection of enemy information to conform to the requirements of the existing situation and the newly determined essential elements of enemy information. These essential elements in many cases will be little changed from those forming the basis of the plan already in operation. Therefore, the existing plan usually is looked over and changed in its details, instead of making up a new plan. G-2 discusses the plan with his senior assistant, indicate what changes or additions he considers necessary, and then generally leaves to the assistant the detailed work of bringing the plan up to date.

d. Coordination.—Where the revision of the G-2 Plan necessitates new missions for the collecting agencies, G-2

consults the staff sections concerned, as explained in paragraph 15 *d*. After coordination he procures the issuance of orders for the new missions decided upon. As in the previous phase, G-2 and the air officer constantly work in close cooperation. G-2 keeps informed of the location of front line elements of our own troops by consultation with G-3. He makes arrangements to receive all information gathered by the Artillery Information Service (AIS) and the Antiaircraft Artillery Information Service (AAAIS). He sees to it that all information of the enemy gathered by agencies not on purely reconnaissance missions, such as security detachments, antitank units, artillery spotting planes and balloons reach his office promptly.

e. Study and dissemination of information.—(1) Work having been initiated on revision of the plan, G-2 should, so far as possible, hold himself free from details of that task in order that he may devote himself without delay to the study of any new information as it is received.

(2) As pointed out in paragraph 15 *e*, the chief personal function of G-2 at this time is the study of information in order to be prepared to give quickly an estimate of the enemy situation and to assure that information, as it comes in, is promptly and correctly disseminated. He is particularly watchful for indications of a radical change in the enemy situation which might affect the plan for the attack. Any such indication is promptly given to the chief of staff, together with such changes it may make in the G-2 estimate. It may require the prompt dispatch of a special reconnaissance mission to verify or disprove it. Where some changes in conditions indicates its necessity, or when called upon by higher, lower or adjacent units, G-2 supervises the preparation of a special report on the situation. If this phase of the action extends beyond the hour when the periodical G-2 Report is to be rendered, G-2 checks the report as prepared by his assistants and usually himself furnishes the conclusions contained therein as to enemy capabilities at the time.

(3) G-2 in his plan especially provides for reception of reports from agencies at times which will enable him to give the commander an estimate of the enemy situation on his return to the command post (paragraph 19 *c*) and again shortly before the time set for launching the attack.

f. Personal reconnaissance.—During that phase G-2 usually is fully occupied by his duties at the command post. Under certain conditions, when a considerable time elapses between the final decision for the attack and the launching of the attack, G-2 may visit the division observation post or some front-line unit. Such personal reconnaissance will always be made with a predetermined purpose in view, usually to gain personal impressions of the situation at some vital point. At times, an aerial reconnaissance of a critical area may be made by G-2, if he is a qualified observer. In the general case, however, G-2 can best fulfill his functions by relying upon the collecting agencies available to him to secure enemy information.

g. Liaison.—At this time, when agencies, particularly subordinate infantry units, become absorbed in battle missions, G-2 considers the need for liaison agents with those which may gain critical information prior to, or during, the attack. Where such need can be foreseen, G-2 either provides for the presence of one of his commissioned assistants with such unit or may ask for one of the aides from the chief of staff to perform this function. Where a contemplated operation may be expected to yield prisoners with critical information, he provides for the presence of one of the officers of his section and the enlisted interpreter with the front-line unit involved.

23. G-4.—*a. General.*—The statements in paragraph 16 *a* relative to the general duties of G-4 and the organization of his staff section also are applicable here.

b. The plan for the attack.—G-4, together with other members of the general staff and such special staff officers as may be present, received the commander's plan for attack, and such additional instructions as the chief of staff may have given at the first staff conference. Having kept in touch with the tentative plans of G-3, G-4 has sufficient knowledge of the tactical situation and future plans of operations to formulate his plan of supply and evacuation to support the attack. If a conference with the special staff has not been held previously, he immediately goes to a prearranged conference with those special officers charged with supply and evacuation.

c. The special staff conference.—After the preliminary conference with the special staff and after their reconnais-

sances have been completed, G-4 holds a second conference with the special staff to receive their recommendations as to the employment of their services in support of the attack.

Based on these staff recommendations and his decisions thereon, G-4 formulates his detailed plan and issues such instructions to the special staff as do not require the prior approval of the chief of staff. He confers with G-1, who would be present at this conference with reference to that part of the administrative plan for which the First Section is responsible.

d. The administrative plan and orders.—Upon the completion of the administrative plan, G-4 submits its basic elements to the chief of staff for approval. After approval of the administrative plan, G-4 issues such fragmentary instructions as are necessary immediately to carry out its provisions. He turns over to G-3 such instructions as are to be included in paragraph 4 of the field orders. He supervises the preparation of the administrative instructions by his assistant. If, instead of including such matters in paragraph 4 of the field orders, an administrative order is to be issued, G-4 supervises the preparation of the administrative order by his assistant. The administrative order is then issued as soon as practicable. When the administrative instructions are completed, G-4 submits them to the chief of staff for approval.

24. G-1.—*a. General.*—The statements in paragraph 17 *a* relative to the general duties of G-1 and the organization of his staff section also are applicable here.

b. The plan for the attack.—G-1, together with other members of the general staff and such special staff officers as may be present, received the commander's plan for the attack and such additional instructions as the chief of staff may have given since his first staff conference. Having kept in touch with the tentative plans of G-3 and the artillery commander, G-1 has sufficient knowledge of the tactical situation to formulate his plan for the control of personnel, prisoners of war and the civil population, if necessary, during the attack.

c. The special staff conference.—After the preliminary conference with the special staff and after they have had an opportunity for a detailed reconnaissance, G-1, with G-4,

holds a second conference with the special staff officers to receive recommendations.

Based on these recommendations and his decisions thereon, G-1 formulates his detailed plan and issues such instructions as do not require prior approval or have the approval of the chief of staff. G-1 then confers and coordinates with G-4 such parts of his plans as affects the whole command.

d. The administrative plan and orders.—Upon completion of the administrative plan, G-4 submits its basic elements to the chief of staff for approval. After approval of the administrative plan, G-1 issues such instructions as are necessary to carry out that part of its provisions for which the First Section is responsible, and furnishes to G-4 the necessary data for inclosure in paragraph 4 of the field order, or administrative order and instructions.

ANTITANK DEFENSE

CONTENTS

	Paragraphs
SECTION I.—General	1-10
II.—Employment of Antitank Units During the Advance	11-13
III.—Employment of Antitank Units During Halts	14-16
IV.—Employment of Antitank Units During the Development	17-20
V.—Employment of Antitank Units During the Defense	21-23
VI.—Employment of Antitank Units During Retrograde Movements	24-26
VII.—Employment of Antitank Units During Offensive Operations	27-31

SECTION I

General

	Paragraph
Definition	1
Scope	2
General basis of defense	3
Types of interference to be expected from tanks	4
Positive measures of defense	5
Negative measures of defense	6
Principles of antitank unit employment	7
The regimental company	8
The division battalion	9
Coordination	10

1. DEFINITION.—In this text the term *tank* includes all armored combat vehicles—scout cars, armored cars, combat cars, and tanks. Tank units as contemplated in this text may be organizations or groupings of a single type of these vehicles or of several types together with supporting weapons designed to operate with such units.

2. SCOPE.—*a.* This text deals generally with all forms of security and defense against such vehicles or units and specifically with the employment of the antitank units with which it is assumed that the infantry division is provided. Since the infantry division is the basic organization of the

army, the discussion is based on the principal types of operations in which a division engages either independently or as a part of a larger force.

b. In an open warfare situation it cannot be expected that a division operating alone or even in conjunction with other divisions will, by use of its antitank guns alone, be able to oppose a successful defense to an enemy disposing of powerful masses of tanks. Where such is a possibility the division will have to be powerfully reinforced and the fullest possible use will have to be made of means other than antitank guns in order to defend successfully. Such conditions are not within the scope of this text. This discussion is limited to the principles governing the use a division makes of its organic resources in antitank guns together with a discussion of the employment of other means, always limited as to time and quantity, available to a division in an open warfare situation.

3. GENERAL BASIS OF DEFENSE.—a. No matter in what form of operation a division is engaged, the basis of the passive measures of defense against any type of hostile interference is made up of three elements; information, delaying action, and resistance. Information gathering agencies operate in all directions from which the command may be threatened. Steps may be taken to delay any threat. Resistance to any threat which approaches the main forces must be established. These principles apply with equal force to defense against tanks, the only difference being in the special methods applicable when hostile forces consist of or include tanks.

b. Aviation seeks information at a distance and also close in. It seeks information regarding tank elements both large and small in addition to other types of information. Within the outer limits of air reconnaissance, motorized reconnaissance agencies are employed, and these seek information regarding hostile tanks as well as regarding other items. Still closer in, other ground reconnaissance elements are employed and they too seek information regarding hostile tanks.

c. Information gathering agencies of the ground types outlined above can and may be given missions of executing delay against hostile tanks which may endeavor to push back or penetrate the reconnaissance screen. On occasion

special forces may be sent out from the main force to delay approaching hostile tanks. Both positive measures and the appropriate negative measures discussed below may be employed.

d. When the opposing main forces come into close proximity to each other or when hostile tank elements penetrate the reconnaissance and delaying screens, active measures of resistance to tank operations must be taken.

4. TYPES OF INTERFERENCE TO BE EXPECTED FROM TANKS.—a. The enemy also covers himself with reconnaissance agencies. It is to be expected that hostile tanks of the scout and armored car types, bent on reconnaissance, may penetrate our screen for close reconnaissance of our main force. While their primary mission will normally be reconnaissance, it is to be expected that such elements which may gain contact may endeavor to harass, delay or otherwise interfere with our main forces. Serious attacks from such elements are not to be expected. They will endeavor by long range fire and rapid change of position to inflict the maximum delay and interference. The danger from such attacks will vary widely according to the situation. An interior division will be subject to such interference only from the front, and when close contact is gained with hostile main forces this danger will disappear. An exterior or independent division may be exposed to such elements in many directions, even when in close contact with the opposing main force. The form which interference by such elements may take will also vary according to the type of operation. This point is discussed further in connection with the discussion of protection against such elements in the various types of operations considered.

b. In addition to the activities of harassing and reconnaissance elements, the division may be exposed to the operations of well organized tank units. These operations may consist of delaying actions, independent attacks by such forces, or attacks by such forces in conjunction with organized attacks by elements of all arms. The danger from such operations will increase as the hostile main forces are approached and as our own ground reconnaissance screen becomes more circumscribed. The operations of such forces from directions in which our reconnaissance agencies are operating at a reasonable distance should not come as a com-

plete surprise. Even if not detected by our aviation, such forces will have to penetrate our ground reconnaissance screen and information of their approach should arrive in time. On those portions of the front where the main forces are in close proximity, such attacks may come with great rapidity and with a high degree of surprise. A much higher degree of readiness or preparation to meet such attacks will, therefore, be necessary.

c. Tanks may launch attacks under cover of smoke or fog as a measure for reducing the effectiveness of the fire of antitank weapons. Such conditions will tend toward surprise and will require a high degree of readiness at vulnerable points. In such cases the use of mines and artificial obstacles will be valuable as will a distribution of antitank guns in depth.

5. POSITIVE MEASURES OF DEFENSE.—a. The primary positive methods of defense which seek to destroy or disable hostile tanks consist of the employment of antitank guns, tank mines, tanks, and aviation. The antitank gun is the basis of defense against tanks and this text deals with the employment of this weapon. It is not within the scope of this text to do more than mention the employment of tanks and combat aviation against tanks.

b. Tank mines will be increasingly employed as a positive measure of defense against tanks. Their employment may vary from extensive mine fields established to cover important approaches, to individual mines established at particular places. They may be employed in connection with natural or artificial obstacles or in the open. As a rule such mines will be of the percussion type placed on the ground surface and camouflaged or they may be set into the ground and lightly covered. On occasion mine fields to be detonated by electricity may be employed. Large mine fields and mines established in connection with important obstacles or demolitions usually will be established by the engineers, but even small security detachments may employ mines for local protection. Tank mines will be small, easily portable, and easily fused mines capable of being readily transported and quickly distributed. They will frequently be used for close-in protection around combat posts, battery positions, and command posts.

c. There are several weapons within the division whose ordinary employment precludes their being employed primarily for defense against tanks which can, however, operate incidentally against tanks when the situation so requires.

(1) Artillery can operate effectively against tanks if it is able to employ direct fire. Stationary concentrations of tanks may be fired on in the usual way. As a rule the normal missions of the artillery will preclude its employment against tanks by direct laying except for its own protection. This is particularly true when the artillery is in position to support a given operation. On the other hand it is frequently possible that artillery in position can have reasonable fields for direct fire in some directions and that some of the pieces can be ready to fire on any tanks which may penetrate or elude the other antitank defenses and approach the battery positions. In some cases it may be possible to employ prearranged artillery concentrations to protect areas particularly vulnerable to strong tank attacks. Such concentrations can not, however, be improvised with success after a tank attack starts. When not in position artillery may be prepared to go into action against tanks. This is particularly true in situations when some warning of their approach can be had, such as during a march.

(2) Antiaircraft machine guns, and to a limited extent antiaircraft guns, are effective against tanks. While not sited primarily for this purpose, they are capable of such incidental action should tanks approach their position.

(3) The small-arms weapons in the division are not particularly effective against tanks except at very close ranges when employing suitable ammunition. While not primarily employed for such action, they are capable of a certain measure of defense against tanks which may break into positions occupied by such weapons. Light infantry cannons are capable of cooperating with antitank guns in antitank defense.

6. NEGATIVE MEASURES OF DEFENSE.—a. The utilization of natural obstacles, their improvement, and the creation of artificial obstacles to impede or prevent the operation of tanks is almost always a consideration of importance in providing for defense against tanks. These measures reach their highest degree of importance in defensive

operations, especially when the enemy is strong in tanks. Tanks operate with difficulty at night, especially in masses. Therefore night operations of any kind are less subject to tank attacks than similar operations by daylight.

b. During marches it is seldom practicable to select routes giving a high degree of natural protection against tanks. When there is any choice in the matter and the situation permits, the best protected routes should be employed. Under favorable conditions when the approaches from certain directions are naturally limited to a few avenues, a high degree of security in those directions may be attained by the use of obstacles and demolitions.

c. During halts there is greater opportunity for the utilization of natural and artificial obstacles against tanks. It is often practicable and always desirable to select the halt area on terrain which restricts the operations of tanks to limited areas which can be adequately defended by the positive means available.

d. Defensive operations in general also afford opportunity for the utilization of natural and artificial obstacles against tanks. The selection of any defensive position must take this into account to a greater or less degree depending on the capabilities of the enemy with regard to the employment of tanks. When the enemy is very strong in tanks it may be necessary to establish the defensive position on terrain giving a high degree of natural protection, or on terrain which can artificially be made strong against tanks, to the exclusion of many other considerations. The desire to have good fields of fire for a defensive position and to have long fields of fire for delaying positions may have to give way to considerations of protection against tanks. The utilization of natural and artificial obstacles in the defense has for its purpose the canalization of hostile tank attacks, since it will rarely be practicable to establish the defense on completely tank secure terrain. When practicable, a tank attack should be canalized from the time it comes under fire right up to the defensive position in order to prevent the hostile tanks from fanning out as they approach the position. During retrograde movements artificial obstacles should be employed freely to hamper the hostile follow-up.

e. During offensive operations there will usually be less opportunity and less need for the employment of obstacles

against tanks. Their use will not, however, be neglected when it is practicable to employ them. Both natural and artificial obstacles may be employed to protect exposed flanks and to protect gaps between elements of the attacking forces where there is danger of the enemy endeavoring to push tanks into the gaps or of launching flanking counter-attacks.

7. PRINCIPLES OF ANTITANK UNIT EMPLOYMENT.—*a.*

It is assumed at present that the antitank units of the division are equipped with the caliber .50 machine gun and are motorized and provided with means of rapid ground reconnaissance and rapid communication. The principles laid down herein are applicable to any suitable antitank gun of suitable mobility which may be developed. This text does not concern itself with technical problems in the operation of these units but only with the principles relating to their employment and control.

b. A few tanks can be combated by a few antitank guns. On the other hand an organized tank attack must be met by a well organized antitank gun defense which will normally employ complete units. When the division is subject to harassment by tank detachments from many directions, there will be a desire to make a wide distribution of antitank guns to protect against such interference. However, an organized attack calls for the concentration of strong antitank forces. These conflicting considerations will often be present. Once initiated, tank attacks develop with speed. To meet such attacks it is necessary that antitank guns be in position when the tanks come within range. There will be no opportunity to assemble antitank units to meet an attack which has started.

c. Antitank units can not operate everywhere and at all times. Their employment must be such as to conserve them for vital employment. Continuous operations over wide areas, if habitually employed, will dissipate the strength of the units to an extent that there is danger that they will not be prepared to act at critical moments. In principle a minimum portion of the antitank guns should be employed for routine measures of protection or protection against minor tank threats and the maximum portion should be held in hand in readiness to meet strong tank attacks.

d. The proper employment of antitank units will result only from a proper estimate of the situation which takes into account particularly the terrain and the enemy capabilities for the employment of tanks. Usually the division or regimental commander is the only one who can make such an estimate properly. For the division commander to pass this responsibility to the commander of the division battalion, or for the regimental commander to pass it to the commander of the regimental company, is merely to pass responsibility for the estimate to a person who is not in position to make it. Antitank units should not, therefore, as a rule be given blanket, general missions of protecting the division or regiment in a given situation. The missions assigned should be specific. When possible they should be specific as regards time, place, and responsibility, leaving to the commander of the unit the methods to be employed. It is not always possible to give such specific missions covering all contingencies, especially in a moving situation. Two methods are applicable in such situations. The commander may hold the antitank unit in hand and assign a series of specific missions as the occasion demands. Another method is to outline the types of missions to be performed during a period, giving, if possible, the area or areas to which the responsibility is restricted and the controlling time elements. Directions regarding cooperation with the operations of other elements of the command should always be given. In some cases when several types of missions are assigned, it may be necessary to indicate a priority of time or of importance.

e. It has been noted that the operations of tanks are greatly restricted at night. The same is true of antitank guns. Essentially they are direct fire weapons which depend on visibility for effect and are not weapons whose fire can be effectively fixed at night to cover approaches. Of course they are not withdrawn completely from action at night, but it will be very exceptional to employ them at night beyond the immediate support of other troops. In the majority of night operations the governing consideration with respect to the antitank units will be to have them in hand and prepared to meet the situation which will confront the command at daylight.

8. THE REGIMENTAL COMPANY.—*a.* The regimental company is primarily a regimental agency and, in the majority of cases, operates directly with the regiment or its elements for the immediate protection of the infantry, on which the brunt of the battle falls, against the operations of hostile tanks. In most cases when the regiment is operating as a unit the company will remain under regimental control in order that proper coordination may be effected in the regimental area. Direct attachment of the platoons of the regimental company to battalions will only occasionally be employed.

b. When battalions of the regiment are detached for other missions it will be usual for them to be accompanied by some of the antitank guns of the regiment, usually at the rate of one platoon per battalion so detached. In such cases the antitank guns will frequently be attached to the battalion. On other occasions, as when the battalion still remains within the sphere of responsibility of the regiment, they will be retained under regimental control and their actions coordinated with the other antitank elements.

c. When the situation permits, the antitank guns of the regiment may give incidental protection to elements not provided with antitank guns which may be operating in or near the regimental area. This should not be required when it will have an appreciable effect on their primary role of protecting the regiment.

9. THE DIVISION BATTALION.—*a.* The primary functions of the division antitank battalion are to protect the elements of the division not provided with antitank guns and to meet strong attacks delivered against the division at times and places where the guns of the regimental companies are not adequate or are not in position to meet such attacks. The division battalion may be called on to furnish detachments to operate with elements of the division, such as reconnaissance detachments, operating at a distance.

b. The most important field of employment for the division battalion will occur when the division is operating independently or is on an exposed flank. In such cases there may be considerable danger of tank attacks against areas and establishments not defended by infantry. When the flanks of the division are secure, the primary role of the division

battalion will be to reinforce and give depth to the protection established by the regimental companies.

10. COORDINATION.—*a.* The coordination of antitank defense is a matter of considerable importance if the best and most complete defense is to be achieved. This coordination is a function of command, and its extent and nature will vary widely with the situation. It will require coordination not only of the activities of the antitank guns but also of the employment of tank mines and artificial obstacles.

b. With regard to the coordination of the activities of the various antitank units with each other, this coordination is effected by the regimental commander within the regimental area and the necessary coordination between the regiments of a brigade is effected by the brigade commander. The division commander will effect the necessary coordination between the brigades and that of the division antitank battalion with respect to the antitank guns of the regiments. The manner in which this coordination will be effected will vary widely with the situation. In a static situation this coordination may be effected initially by order. In a moving situation or in one which develops rapidly it will not be practicable to insure coordination by order in time to meet every change in the situation. In such situations the commanders on the ground, especially the commanders of antitank units, must be impressed with the necessity for voluntary local coordination with adjacent antitank units. Regimental, brigade, and division commanders will, as soon as practicable in such situations, assure themselves of the effectiveness of this coordination and will effect such rectifications as may be necessary.

c. The creation of artificial obstacles and the establishment of mine fields has a determining influence on the location of units and establishments and on the dispositions of antitank guns. Such obstacles should not be scattered about without plan but their establishment should be coordinated by the authority disposing of the means for their creation or by the next higher commander when subordinate units are responsible for them. The most effective antitank defense will come as a result of a judicious coordination of the employment of natural obstacles, artificial obstacles and mines, and antitank guns. This coordination, in general, will be effected in the same way as was pointed out on subpara-

graph *b* above for the coordination of antitank guns. This thorough coordination of the various means of defense against tanks will reach its highest degree of importance and completeness in defensive operations. In all operations however, this coordination should be effected to the highest degree possible in the particular situation.

SECTION II

Employment of Antitank Units During the Advance

	Paragraph
Types of attack to which exposed	11
Protection against reconnaissance elements	12
Protection against strong attacks	13

11. TYPES OF ATTACK TO WHICH EXPOSED.—*a.* As has been noted it is to be expected that hostile mechanized detachments may endeavor to harass the marching columns. It should be rare that a marching force will be entirely ignorant of the presence of such elements in the vicinity of the columns. On the other hand, considering the speed with which such elements move, it will probably be impossible to follow all of their movements as they take place. A flank column is exposed to such elements in several directions. An interior column is exposed to the front, to a limited depth on the flanks, and possibly to the rear. It is not to be expected that such hostile elements will endeavor to penetrate deeply between adjacent columns unless the columns are widely separated and the road net is unusually favorable.

b. The operations of a strong tank force against a marching force may take the form of attacks or of delaying action. The former is perhaps more probable than the latter, since tank action is characterized more by sudden, powerful thrusts than by prolonged action. The conditions presuppose an appreciable distance between the opposing main forces, therefore the operations of strong tank forces should not come as a complete surprise.

12. PROTECTION AGAINST RECONNAISSANCE ELEMENTS.—*a.* In the typical case of a division advancing in reinforced regimental columns, the regimental antitank company will be employed in connection with the march of its regiment.

It would be desirable to employ the antitank guns to cover all possible approaches to the column. This will rarely be practicable with the limited number of antitank guns available unless the road net is very limited and the terrain conditions such that the hostile reconnaissance elements can not leave the roads. Under favorable conditions of terrain and road net, however, it may be possible to employ the antitank company in just this manner, the platoons, sections, or guns advancing by bounds from position to position and leap-frogging each other in such manner that all approaches are covered for the period during which the column is threatened along them. This method has the undesirable feature that it often results in having the unit dispersed when a situation arises calling for a quick concentration against a serious threat and also that it may result in a wearing down of the antitank elements to such an extent that their immediate availability is adversely affected. This method should be employed only at such times and places as conditions of terrain and enemy activity are particularly favorable for hostile interference and there is no other adequate method of preventing interference.

b. It will frequently be more desirable to distribute the regimental antitank company by platoon throughout the column in readiness to meet, or to move out to meet, any threat, or to march the major portion of the antitank guns in this manner as a mobile reserve while a portion operates at a distance to cover certain important approaches. If the conditions are such that the threat is limited to the front, the antitank elements should be well forward. If the flanks and rear are also exposed they should be distributed more deeply throughout the column. It will often be advisable to have one of the regimental antitank platoons operate with the advance guard, especially since the front is most threatened by small hostile elements. Such a platoon may operate by any of the methods discussed above or by a combination of them. It may march with the advance guard as a unit in readiness, it may advance by bounds by section or by gun along the route of advance with one portion often in advance of the infantry point and behind the cavalry point, or it may be employed on the flank or flanks to cover important approaches during the passing by the advance guard of a particular area.

c. The division antitank battalion will usually furnish any necessary antitank units to accompany detachments operating at a distance. The bulk of it will normally march with the motor elements of the division and furnish protection to them in the same manner as is furnished the regimental columns by the regimental companies. This protection of the motor elements will usually be simpler than the protection of a regimental column, especially a flank column. The motor elements usually are so placed as to be covered to a considerable degree by the regimental columns. This is highly desirable as it permits a maximum portion of the division antitank battalion to be held together for dispatch to reinforce the regimental companies should such action be necessary or to execute special protective missions essential to the division as a whole. This is particularly true when there is danger of strong attacks.

13. PROTECTION AGAINST STRONG ATTACKS.—*a.* Whereas a few tanks can be combated by a few antitank guns, the attack of an organized tank unit can only be met by the employment of complete antitank units. This is the mission of the division antitank battalion and an incidental mission of the regimental companies. The division antitank battalion, or at least the bulk of it, has to be kept available to meet just such situations. It has to be located in the division march formation in such a manner that it can arrive quickly where needed. As to just where it marches will depend on the situation. That is to say it depends on the probability of hostile attacks. If large scale tank attacks are not to be expected its most suitable location is with the rest of the motorized elements of the division. If the probability of such attacks becomes great, then the antitank battalion has to be disposed in accordance with the situation. It may be assembled centrally and march in readiness until the situation is more clarified; it may be pushed forward and advance by bounds in front of or abreast of the advance guards; it may be moved to an exposed flank where a hostile tank attack is a probability and take position or advance by bounds; or it may occupy a fixed position which will protect the division from such an attack. The particular method will depend on the terrain and the known and possible activities of the hostile tank force. Whatever the method may be, it must assure that the antitank battalion will be on hand

at the right place to meet the hostile attack, or in case the hostile force is engaged in delaying action, to assist in clearing the way for the division with the least practicable delay.

b. In situations where strong hostile tank attacks are to be expected, the primary role of the regimental antitank companies is to protect the regimental columns. In such cases it is very desirable and necessary that the company be well in hand to operate as a unit, but at this very time the necessity for protection against harassing elements is often greater than ever. This consideration may affect the march dispositions of the company in such situations. In case a particular regimental column is attacked by a strong hostile tank force it is not probable that it will be strong enough alone to repel the attack. Its action will only be supplementary to the measures taken by the division antitank battalion. Depending on the situation, the regimental company, in such case, may reinforce or support the division battalion or it may be held back closer to its regiment to repel any vehicles which may break through or elude the defense established by the division battalion.

SECTION III

Employment of Antitank Units During Halts

	Paragraph
Types of attack to which exposed	14
Protection when not in close proximity to the enemy	15
Protection when in close proximity to the enemy	16

14. TYPES OF ATTACK TO WHICH EXPOSED.—If the division is halted at an appreciable distance from the enemy main forces the types of attack to which exposed will be similar to those during a march—interference by small harassing detachments, or attack by strong forces operating at some distance from the enemy main forces. If the halt is in close proximity to the enemy under conditions which place within the capabilities of the enemy the possibility of an organized and coordinated attack on any portion of the bivouac area, a quickly launched hostile attack by considerable tank forces may have to be expected. In this lat-

ter case the measures necessary will partake of the nature of those required in a defensive situation.

15. PROTECTION WHEN NOT IN CLOSE PROXIMITY TO THE ENEMY.—*a.* The division will normally bivouac by regimental or brigade combat teams, each of which will protect its area against tank action by employing its antitank company or companies. Normally there will be another protected area occupied by the elements of the division not incorporated in the regimental or brigade combat teams. Elements of the division antitank battalion will furnish the antitank protection of the last named area. There will normally be a careful coordination of the outpost system between the adjacent protected areas.

b. Each regiment or brigade combat team will protect itself in all directions not adequately covered by adjacent elements. In doing so it will establish a system of outposts consisting mainly of defended road blocks backed up by small supports for reinforcement and patrolling between the detachments guarding the road blocks. The area containing the other elements of the division will be protected in a similar manner by the troops therein. The antitank units will dispose a portion of their guns to reinforce the action of the elements defending the outpost line. Generally only a few antitank guns will be thus disposed. They normally will be stationed in readiness by single gun or by section in suitable places in rear of the outpost line prepared to engage any hostile vehicles which may try to detour or break through the road blocks. The major portion of the antitank guns will be held well in hand within the protected area in readiness to move to any portion of the front which may be assailed by a force greater than the few guns disposed on the ground can deal with.

c. The system outlined above will require little or no modification in situations in which there is a probability of attack by strong tank forces. In such cases there will be greater necessity for holding a maximum number of guns in readiness to intercept such an attack. Greater importance will attach to reconnaissance of positions suitable for meeting strong attacks both within and without the general protected area. The occupation of such positions will, as in the advance, be primarily the function of the division antitank battalion.

16. PROTECTION WHEN IN CLOSE PROXIMITY TO THE ENEMY.—*a.* In this case it will often be necessary for the force commander to establish strong protective forces to cover those portions of the front on which coordinated hostile attacks by all arms are a possibility. Such protective forces must have antitank guns, and normally these guns will come from the regiments furnishing the infantry for such forces. These guns will operate as in any defensive situation, remembering though, that such protective forces are used only to the extent necessary to enable the main forces to prepare for battle.

b. Other exposed directions will be covered in a manner similar to that outlined in paragraph 15. It may be possible for the enemy to launch strong tank attacks not only against that portion of the area which is covered by strong protective forces, but also against exposed localities which are more or less secure against attack by hostile infantry. It will be necessary to have the bulk of the antitank guns in instant readiness to meet such attacks. The outpost established by the force commander may be attacked. If so, it will not normally be reinforced since its primary mission is to gain time for the troops in rear to occupy defensive positions. The regiments charged with occupying the defensive position in case of such an attack or threat of attack will be responsible for posting their antitank guns to stop any tanks that may overrun the outpost. Regiments not so concerned will protect their own areas. The division antitank battalion may be employed to reinforce the regimental guns in case of an attack or threatened attack on a regimental area or position or, what is more probable, the bulk of the division antitank guns may have to be held in readiness to meet any attack which may strike at areas not defended by infantry. In some cases this latter protection may be effected by having the division antitank guns occupy definite, prearranged positions. In other cases, particularly when the hostile attack is not canalized, the bulk of the division antitank battalion will be held in readiness to move to any point that may be threatened. Several suitable positions should be **reconnoitered**.

SECTION IV

Employment of Antitank Units During the Development

	Paragraph
The development	17
Types of attack to which exposed	18
Employment of the regimental company	19
Employment of the division battalion	20

17. THE DEVELOPMENT.—*a.* While this section of the text treats of the development, it will be understood to include all of the phases during which preparations for battle are made. Actually the discussion includes the development and deployment phases of the preparation for a definite type of combat.

b. Development infers an increase in the readiness for battle on the part of the unit and increased security from the effects of hostile interference. A march in several columns is a partial development but the considerations applicable in that case were considered under the subject of the advance. During the further progress of the development the advance elements are probably being organized under the protection of the artillery. A portion of the force may be engaged in driving in the hostile covering forces or resisting the efforts of the enemy to drive in our covering forces. Other units will be moving into assembly areas or into position. During the development, therefore, the division area will be filled with numerous small units distributed in width and depth. Part of the artillery may go into position while another part may advance outside of the existing march columns. All units are moving in accordance with the plans of the division commander into dispositions favorable for the coming battle. The compact march columns disappear. The units to be protected against tank attacks become smaller but also more numerous and the danger of surprise attack by tanks is much greater.

c. At times the development of the division is protected by advance units which are either the advance guards or highly mobile units which have the mission of protecting the development of the division along a suitable terrain feature. If the flanks of the division are secure the employ-

ment of the antitank units is comparatively simple. The advance units will have been provided with antitank units. The mass of the developing division is moving behind a more or less strong security line and is therefore not in immediate danger of tank attack, unless one or both flanks are exposed. Sometimes, however, this advanced security will be lacking during the development and there will be only reconnaissance elements out in the threatened directions. The best defense against tanks is efficient reconnaissance. However, during the development the advance of hostile tank forces can, as a rule, no longer be determined while they are still some distance away. The enemy is too close for that. If the antitank units are not kept well forward in threatened directions the danger is risked that, considering the speed of tanks, that they will arrive too late. In general, therefore, it can be concluded that during the development antitank units should not be dispersed but should be kept in readiness at points where hostile tank attacks are most probable.

d. Only the principal roads were used during the advance; the development takes place on all available roads and partly without any roads at all. The objective during the advance is to bring up personnel and matériel as quickly as possible on the most direct route and with the least exertion; the mission of the developed force is to approach the enemy prepared for battle and avoid his observation and fire by utilizing all available cover. The utilization of terrain during the advance becomes only a secondary matter; it becomes a matter of first importance during the development as a means of defense against tank attacks. Therefore, if during the development there are terrain areas secure against attacks by tanks, they should be utilized to the fullest extent.

18. TYPES OF ATTACK TO WHICH EXPOSED.—a. Normally the division develops in close proximity to the enemy. The beginning of a battle or the possibility of a battle is imminent. From this moment on the reconnaissance by hostile armored vehicles is, as a rule, no longer to be expected on the front of the division because the hostile lines have approached each other so closely that a unit requiring large maneuver space no longer has sufficient space in which to operate. An independent division or one on an exposed flank will still have to reckon on hostile reconnaissance of

its flanks. It is probable, however, that hostile vehicles operating on the flanks at this stage will be concerned more with reconnaissance than with attempts to harass the division. On the other hand, the closer one approaches to the enemy the greater the possibility of an organized tank attack.

b. The nearer the enemy main forces, the more surprising a tank attack may be. All ground reconnaissance is limited by the front line of the enemy. Air reconnaissance which can look behind the enemy's front is not in position to give definite negative information. Definite determinations as a result of air reconnaissance, especially if supplemented by aerial photographs, are conclusive, but all negative determinations will have to be accepted with reservations.

c. Generally speaking, each side will only be vaguely informed of the enemy dispositions and will normally not know exactly where and in what formation the mass of the enemy is located at any given moment. It will normally be improbable that the enemy will use tanks alone in an attack which seeks a decision. But on the other hand it is to be expected that the enemy will try to capture certain terrain features which he desires for the later battle, and he may commit large as well as small tank elements for that purpose. Tank elements are particularly suitable for the quick capture of terrain features which other units could not reach in time. During the development, therefore, normally there will be no attacks by tank forces alone seeking a definite decision, but it is highly probable that there will be local tank attacks which may, however, be executed by comparatively large units.

19. EMPLOYMENT OF THE REGIMENTAL COMPANY.—*a.* During the development the primary concern is with the attack by organized tank units, which may develop quickly. The location of the antitank company has to be at the place where a tank attack is favored by the terrain and the situation. This may be in the midst of the regiment, to its flank, or to its front. If the regiment is in motion the position may be a fixed one covering the movement, with changes of position as the movement progresses. While a regiment may be on an exposed flank and consequently exposed not only to strong attacks but to harassment by small detachments, there should be a minimum of the guns employed to counter the

action of hostile reconnaissance elements. This can be done since, during the development, the general formation of the regiment will usually be much less vulnerable to such interference than it was during the march. In any event it will be necessary to give the antitank company specific missions and not a general one of protecting the development of the regiment.

b. Where and how the antitank company is to be moved depends to a large extent on the terrain. Therefore a thorough, timely, and constant reconnaissance of the terrain is necessary. It has to be initiated by the company commander and carried out with the means at his disposal.

c. There may be situations during the development in which the entire antitank company may have to be committed. For example, when the regiment is advancing against a hill or is approaching the edge of a woods it may be desirable to advance the antitank company to the crest of the hill or against the edge of the woods in order to furnish the necessary security. In other words, there may be situations in which the antitank company will be committed even though a tank attack is not known to be imminent. This is particularly necessary when minor attacks against particularly vital terrain may be expected. If these occur, then the antitank company has to be ready, its employment has to be foreseen, otherwise it may arrive too late.

d. The antitank company of the regiment normally should remain as a unit under the control of the regimental commander who will let it either advance with his unit or will commit it as the situation requires. If a battalion is detached on an independent mission it must be given an antitank platoon.

e. It is possible that the situation may be such that the regimental company is inadequate to afford the necessary protection of the regiment. On the other hand, we may well assume that it is usually not necessary to protect the entire perimeter of the regiment but only certain points. If additional protection is essential it must come from the division antitank battalion.

20. EMPLOYMENT OF THE DIVISION BATTALION.—*a.* Except for the infantry elements of the division no unit has organically any strictly antitank weapons. During the developments most other units will probably be located be-

hind at least a part of the infantry. Therefore they will not be immediately exposed to tank attacks unless perhaps from the flank or rear if these are not secure and there is no infantry in those directions. During the development the bulk of the infantry will be exposed unless a more or less strong security line located to the front of the division protects it from that direction.

b. The antitank battalion of the division will, therefore, have the mission of being available at the most probable point of hostile tank attack during the development. This will depend on the terrain and the situation, and it may be in front of, within, behind, or to the flank of the advanced infantry. Whereas the regimental commander has only to consider a relatively small area and is constantly with his regiment and therefore can arrange for the commitment of his units as the occasion arises, the situation affecting the division commander is entirely different. First of all the space which a developed division occupies is too large for the division commander, engaged as he is with many other duties, to watch and guard against a quickly developing tank attack. In this case the antitank battalion will have to be given a certain amount of independent leeway in spite of the undesirability of giving general missions; that is, assuming that the situation is such that a tank attack is imminent.

c. The division commander has to consider the entire situation which he alone can view adequately, consider the terrain (by a map study and by personal reconnaissance) and figure on the possibility of tank attacks. Furthermore, if he takes into consideration the type and purpose of the development and the time and space factors when areas which are particularly dangerous will be reached or occupied, he has a basis for the orders to the antitank battalion. These orders will usually prescribe a series of areas in which protection must be furnished in a given direction or directions together with the times at which the successive missions are to be executed. The selection of the positions to be occupied and the methods of occupying them will be a function of the antitank battalion commander.

d. While the regiments have their own antitank protection, the plans for the employment of the division battalion must contemplate the situations which may arise in

which the regimental protection may be inadequate or the protective measures at the disposal of any covering forces may be inadequate. As was noted above, the most probable type of tank attack during the development is one in which the enemy will strive, by means of local attack, to seize certain vital terrain features. Such action should be, as far as is possible, foreseen and taken into account in the plans for the employment of the division antitank battalion. It is just such local tank attacks by the enemy which may involve a regiment or a portion of a regiment in a situation where its own antitank means are insufficient.

SECTION V

Employment of Antitank Units During the Defense

	Paragraph
General considerations	21
Employment of the regimental company	22
Employment of the division battalion	23

21. GENERAL CONSIDERATIONS.—*a.* As in other situations, an exterior or independent division on the defensive may be exposed to hostile harassing elements. The defense against these will present the same problems as were discussed when considering halts and the measures taken will be much the same as those considered in that operation.

b. The primary characteristics of the organized attacks to be expected in a defensive situation will be speed of execution. The enemy will hold his tanks out of range of the defending artillery until the time and place of the attack are chosen and the attack will then be delivered swiftly and in force. Such attacks will normally be delivered so swiftly that it will not be possible to move antitank guns to meet them unless the attack is a wide, sweeping one aimed at the flank or rear and adequate measures have been taken to detect the inception of such an attack. By day, it should be possible to detect such an attack in time to meet it with guns held in readiness. The enemy may make use of the hours of darkness to move such a force secretly to the flank or rear and launch a surprise attack about daylight. When a divi-

sion is operating in the open the greatest danger from organized tank attacks will normally be about that time. It follows then, that in principle, antitank guns designed to meet organized tank attacks will have to be in position on the ground to be defended by the time the hostile attack comes within range.

c. The above considerations indicate that, considering only the weapons at the disposal of the division, its defensive operations will be powerfully influenced by the extent to which the enemy disposes of tank units. Intelligence activities designed to determine this point will, therefore, assume great importance. The stronger the enemy's means, the stronger will be the influence of the terrain on the defensive operations.

22. EMPLOYMENT OF THE REGIMENTAL COMPANY.—a.

This company is for the protection of the regiment and it will be unusual for it to be detached from its regiment for use elsewhere. Such action may be appropriate if the position occupied by the regiment for the defense is on completely tank-secure terrain. If the regiment furnishes detachments for security or other purposes, such detachments will be provided with some antitank guns from the regimental company, usually at the rate of one platoon for each battalion so detached.

b. When the entire regiment is disposed on the battle position the antitank guns of the regiment are disposed to give protection against tanks on the ground occupied. In such cases the guns so disposed will have to be in position. Their fields of fire and mutual support will be coordinated by the regimental commander for the entire position. It will be unusual in such cases to attach platoons to battalions. In establishing this defense it is desirable to site the guns so that a tank attack may be taken under fire and stopped before it reaches the main line of resistance. This consideration impels the emplacing of the guns well forward. On the other hand, if the guns are all far forward some of them may be put out of action by countermeasures taken by the enemy prior to and during the launching of the attack. There will have to be some distribution in depth. Some distribution in depth is especially necessary if the flank or rear of the regiment is exposed. Guns disposed in depth may be

in position or may be held mobile prepared to occupy positions as the situation develops depending on the conditions existing in the particular case.

c. Frequently, in an open warfare situation, one or more of the battalions of the regiment will be held back in reserve. These battalions will have executed reconnaissances and will be prepared to occupy the regimental reserve line, to occupy extensions of the battle position, or to counterattack. It will often be necessary to hold some antitank guns in readiness to operate with these battalions when they are committed to action. If the flanks of the regiment are secure it may not be necessary to hold out antitank guns with reserve battalions. In such a case the majority or all of the guns may be disposed on the battle position to give the antitank defense strength and depth. If the flanks are not secure, the guns held in readiness to operate with the reserve battalions may operate in several ways. Initially, they may be located so as to protect the assembly areas of such battalions, some of them being disposed to back up the security detachments established by these battalions. Next, when the employment of a reserve battalion is initiated these guns may precede the battalion to the position to be occupied and furnish antitank protection during the occupation of the position. Finally, they will participate in the defense of the position occupied.

d. If the regiment employs a battalion for counterattack, some antitank guns should be posted to protect the counterattacking force from hostile countermeasures which employ tanks. In such case the flanks of the counterattacking force may be particularly vulnerable. If the counterattack succeeds, such guns may then be employed to reestablish the defense against tanks on the ground reoccupied.

e. In all of the operations discussed above as taking place in the regimental area, the best results will usually be obtained by a coordinated employment of the antitank guns under the direction of the regimental commander.

f. In some cases, particularly during the early stages of the occupation of a defensive position when the enemy is in close proximity, the force commander may establish a strong outpost forward of the battle position to be occupied in order to protect the occupation of the position. Usually

this will be done by detaching certain battalions from their regiments for this duty. Such battalions must normally be accompanied by antitank guns from their regiments. In the normal case it is not desired that such an outpost fight to a conclusion unless such action is necessary to accomplish the purpose required. This force will often be withdrawn as soon as the danger which required its establishment has passed. Battalions so employed will often have to defend wide fronts and will be able to dispose themselves with only slight depth. Usually all of the antitank guns with them will be sited in position well forward in order to take approaching tanks under fire without delay. After such an outpost has been withdrawn or driven in and before the enemy attacks the position in rear, the units occupying the battle position will employ some form of local security to cover the position. In this stage it will be unusual to employ antitank guns forward of the main line of resistance. The available guns will, at that time, be sited for the defense of the battle position; that is, within it, or will be in readiness in rear.

g. When conditions are such as to necessitate the establishment of antitank defense well in depth in the regimental area, the regimental antitank guns will be given such incidental protection to elements of other arms, such as artillery, operating in the regimental areas as may be practicable without diverting them from their primary task of defending the infantry units.

23. EMPLOYMENT OF THE DIVISION BATTALION.—*a.*

When the flanks of the division are secure the division antitank battalion will usually be disposed in position to strengthen the defense of the main battle position, to give the defense depth, and to protect units in rear of the battle position, such as artillery, against any tanks that may succeed in breaking through the forward defenses. The employment of the division battalion to strengthen the antitank defense of the battle position may be appropriate in those areas most subject to tank attack due to the situation and to conditions of terrain. In such cases these guns are preferably employed to give depth to the defense, thus freeing the regimental guns for action farther forward. However, if necessary, some division antitank guns may be disposed for direct protection of the main line of resistance. Guns

so employed within a regimental sector will preferably be attached to the regiment in order to insure thorough coordination.

b. If the flanks or rear of the division are exposed to flank attack, it will not, normally, be practicable initially to employ the guns of the division battalion in the regimental areas for the protection of the battle position. Their primary mission will be to protect the rear elements of the division against attacks on areas not defended by infantry. A wide variety of method may be employed depending on the situation and on the terrain. The primary elements to be protected will be the division artillery, important local supply establishments, and the command post. When this area of the division is vulnerable in many directions it will be usual to dispose the bulk of the division battalion in readiness with a minimum number of its guns disposed in connection with the local security measures established against small raiding elements. Intense reconnaissance of every possible kind will be employed to give warning of an attack against the flank or rear in order to insure that the battalion can move to meet it in time. When conditions of terrain or artificial obstacles that have been established tend to restrict the vulnerable area to a single approach or a few approaches, the better solution may be to establish the guns of the division battalion for the protection of these approaches by having all or a part of them occupy definite defensive positions. Whatever be the disposition made of the division battalion for the defense of the flank and rear areas not defended by infantry, it should not be such as to preclude the battalion from intervening should a tank attack overrun or threaten to overrun the infantry.

SECTION VI

Employment of Antitank Units During Retrograde Movements

	Paragraph
Protection during a retirement	24
Protection during a withdrawal from action	25
Protection during a delaying action in successive positions	26

24. PROTECTION DURING A RETIREMENT.—a. The situation here considered is one in which the retiring force is

not in immediate contact with the enemy. It may or may not have been preceded by a withdrawal from action. If the division is an interior one the threat will be principally from the rear. The enemy may, in this case, endeavor to push forward rapidly moving tank elements for the purpose of striking quickly at the rear guards in an endeavor to brush them aside or drive them in and push on to strike at the main columns. The rear guards should, therefore, be strong in antitank guns. The antitank guns with the main columns will operate primarily with the rear elements of the retiring columns.

b. If the flanks of the division are exposed it is much more likely that the enemy will push his tank elements around the flanks, avoiding the rear guards, in an endeavor to strike at the flanks or leading elements of the retiring columns.

c. In this type of retrograde movement it should be possible to detect the approach of tank forces capable of making an organized attack if the reconnaissance measures taken have been adequate. The defense against tanks during a retirement will present almost the same problems as in the case of an advance and much the same measures of protection will be appropriate. An important consideration is that such interference and attacks will be more probable during a retirement than during an advance. During an advance the advance guards are more likely to encounter delaying elements or elements making short quick attacks. During a retirement the rear guards are more exposed to strong attacks which will be pushed well home.

d. The antitank guns with the rear guards will come from the infantry furnishing the bulk of the rear guards. If the flanks of the division are not exposed it may be appropriate to reinforce the rear guards with elements of the division antitank battalion. This is particularly true in the case where a single rear guard under division control is employed. If the flanks are exposed it will not, normally, be advisable to employ the division antitank battalion with the rear guards. It must be held in readiness to meet attacks from other directions. In doing so it will be employed according to the principles discussed in connection with the advance.

e. As long as the rear guard is marching, the antitank units will operate much the same as was the case when operating with the advance guard. If the rear guard fights in one position the antitank guns will be disposed as in the defense. If the rear guard fights a delaying action the antitank guns will take position to defend the delaying positions, retiring by bounds or by echelon in such manner as to afford maximum protection at times during which the rear guard is most exposed. These times will usually be when the elements of the rear guard are disengaging from one position and withdrawing to another. The flanks of the rear guard will usually be particularly exposed to tank attack. If the rear guard employs tanks to counterattack in order to be able to disengage, it will be desirable to employ some of the antitank guns to cover the withdrawal of the tanks should they, in turn, be struck by tank elements.

25. PROTECTION DURING A WITHDRAWAL FROM ACTION.

—a. Conditions regarding necessary antitank protection will vary considerably according to the purpose of the withdrawal and the time at which it is made. A withdrawal may be made to a defensive position in rear, it may be made as the first step of a retirement, or it may be made as an incident of a delaying action in successive positions. Also it may be made by day or it may be made by night.

b. If a withdrawal from action is made during darkness, a hostile tank attack during the hours of darkness is improbable. The troops left to cover the withdrawal will be few and will have the primary mission of preventing hostile reconnaissance from detecting the withdrawal. Even if the enemy detects the withdrawal it is unlikely that he will launch a tank attack against the covering troops during darkness. If the flanks are exposed he may utilize the hours of darkness to move tank elements to positions from which they can attack at or shortly after daylight, and such attacks will be more likely against the retiring force or the force on its new position rather than against small covering detachments. If the flanks are not exposed there may be an attack at or about daylight against the covering position. Such an attack will have for its purpose the quick regaining of contact with the main force. The small covering detachments will usually be out of the way by that time and the

main force will be on or near its new position or will be retiring covered by rear guards. In any event the small covering detachments that may be left will not usually be of sufficient importance to justify the employment of considerable elements of the antitank units in connection with them. It follows, therefore, that in the case of a night withdrawal, the primary consideration in disposing of the antitank units is to insure that they are in readiness to meet the situation in which the main elements of the division find themselves at daylight, be it a new defensive position, a new delaying position, or in retirement in march columns.

c. If the withdrawal from action takes place during daylight, an entirely different situation exists. A strong covering force will be used to cover the withdrawal. Prompt attacks by tank elements to dispose of the covering force and to strike the withdrawing forces may be expected. Such a covering force must be strong in antitank guns, particularly if the flanks of the division are secure. If the flanks are secure it may be advisable to reinforce the organic antitank guns of the infantry of the covering force with elements of the division antitank battalion. If the flanks are exposed, direct attacks on the covering force by tanks are less likely. They will be more likely to detour the covering force and strike at the withdrawing elements. In this case the number of antitank guns with the covering force will be kept to a minimum and the maximum number, either from the regimental companies or the division battalion, or both, will be employed to protect the flanks. Those of the regimental companies will protect the withdrawing elements of their regiments and those of the division battalion will protect in those directions not secured by the regimental guns or will reinforce the regimental guns as may be necessary. This protection may be insured by posting antitank elements in position to cover threatened areas and having them retire by bounds in conjunction with the withdrawal, or the situation may be such that they can march in readiness prepared to take position as the situation might demand. Normally, at least a part of them will have to operate on the flanks to intercept harassing elements, though the bulk of them will have to be employed to guard against organized attacks. Antitank guns with the covering force will operate as in the defense while the covering force is in position. As

the covering force withdraws the antitank guns will operate as was indicated in paragraph 24 in discussing the operations of a rear guard.

26. PROTECTION DURING A DELAYING ACTION IN SUCCESSIVE POSITIONS.—*a.* It may be assumed that a division executing a delaying action in successive positions will be operating on a wide front considering the strength of the troops disposed on any one position. As soon as the enemy detects the nature of the operation he will strike quickly to disrupt or to outflank the position. In doing so he will be inclined to employ strong tank forces either alone or in conjunction with an attack by other arms. It may be possible on the first position to deceive the enemy as to the nature of the operation, but he will hardly be deceived on subsequent positions. The wide frontages and the increased probability of tank attacks will make the problem of antitank defense even more serious than in a passive defense situation. There will be need for a strong antitank defense of some form.

b. If the flanks of the division are secure, the protection of the wide front of the delaying position will require the emplacing of the bulk of the antitank guns to defend the position against tank attacks. It will not be practicable, as a rule, under such conditions, to hold a substantial part of the antitank guns in readiness to move to meet the attack. The attack can come too quickly for this method to be successful when there is a wide front to cover. It follows then that in such a case it may be advisable, even if the division is occupying two positions simultaneously, to employ the majority of the antitank guns well forward. Regimental guns will operate in their regimental areas and the division guns will reinforce the defense at critical points. In the normal case the division front will be so great that it may be better to attach the division guns to regiments or brigades for the operation when they are so needed.

c. If the flanks of the division are exposed there will be less probability of tank attacks against the front of the position and greater probability of attacks against the flanks. Such flank attacks will normally strike deeply enough to involve reserves, artillery, and other elements in rear of the delaying position occupied. It will not then be practicable to employ the bulk of the antitank guns well forward. The di-

vision antitank battalion particularly must, in such a case, be employed to protect the flanks. Depending on the situation it may have to protect the flanks of the forward position, the area between the successive positions, or the flanks and rear of the rear position in order to protect adequately those elements other than the infantry and in order to assist in the protection of the reserves. Often the division battalion will be able to hold most of its guns in readiness while intensive reconnaissance is directed toward detecting the movement of tank forces around the flanks of the delaying position. In some cases it may be practicable to dispose the antitank battalion in a single position to give the necessary security. When the flanks are exposed some of the antitank guns of the regiment will normally have to operate with all of the battalions of the regiment wherever they may be and whether the regiment is disposed on a single position or on two positions simultaneously, unless certain portions of the regiment are occupying tank-secure terrain. As in other operations the mission of the division antitank battalion will be the protection of elements other than the infantry and the reinforcement of the infantry as needed.

d. In executing a withdrawal from one delaying position to another the principles stated in paragraph 25 concerning the employment of antitank units in a withdrawal will apply.

SECTION VII

Employment of Antitank Units During Offensive Operations

	Paragraph
Types of operations considered	27
Types of attack to which exposed	28
Principles governing the employment of antitank units	29
Employment of the regimental company	30
Employment of the division battalion	31

27. TYPES OF OPERATIONS CONSIDERED.—The following types of offensive operations are considered:

a. A meeting engagement when both opponents are on the offensive.

b. The attack against an enemy in position:

(1) When he is defending in position.

(2) When he is delaying in successive positions.

c. During the pursuit.

28. TYPES OF ATTACK TO WHICH EXPOSED.—*a.* A meeting engagement when both forces are on the offensive usually produces a rapidly moving situation characterized by limited information regarding the enemy and limited coordination in the offensive operations of either force. If both forces attack promptly neither side has normally the advantage of having been able to select terrain, reconnoiter it, or to fortify it. In such an obscure situation neither side is likely to be in position to organize and deliver tank attacks seeking deep or distant objectives. Tank attacks delivered locally and with limited objectives may be frequent for the purpose of securing terrain needed for the continuation of the operation. Such attacks may develop along the front of the division and also on the flanks if the flanks are exposed. There may be considerable activity on the flanks by hostile reconnaissance elements. As the operations continue the situation will become more clarified, but frequently by that time one force or the other will have been forced to adopt a defensive attitude.

b. In an attack against a defender in position, as long as the attacker is attacking and the defender is defending, the principal reaction by hostile tank elements which the attacker must expect will be in the form of counterattacks. These attacks will usually be local attacks with limited objectives. During the initial stages and before the attacker has penetrated or outflanked the hostile defensive position, such counterattacks will be improbable. Once the attacker has captured or seriously threatened an important tactical locality, such counterattacks may be expected and they may develop very quickly. Again, if the flanks of the attacker are exposed it may be expected that hostile reconnaissance elements will be operating there. However, it is not likely that such elements will, in a situation of this kind, be very aggressive in attacking. Their primary purpose will be to report promptly any move of the attacker toward the flanks.

c. It may be that during the course of an attack the defender will pass to the counteroffensive. This possibility must be borne in mind in planning the attack and, when such a course of action by the enemy is probable, diligent reconnaissance measures are necessary to determine the time and place of the hostile counterblow in time to meet it. Under

these circumstances it may be necessary to hold some anti-tank guns in readiness to meet a counteroffensive employing tanks. A counteroffensive by the enemy does not always throw the attacker entirely on the defensive. A situation may develop in which a part of the force which has been attacking assumes a defensive attitude while the remainder continues the attack. The antitank guns operating with the several elements will be employed according to the principles governing the type of operation with which they are immediately concerned.

d. The enemy may be fighting a delaying action. It may not be possible to determine this, and until the type of operation being engaged in by the enemy is entirely clear, it will be necessary to handle the antitank guns according to the principles applicable to the attack of an enemy defending a position. When it becomes clear that the enemy is fighting a delaying action he will be found to be fighting principally to gain time. He will be bending his efforts primarily to an orderly withdrawal from one delaying position to another. He will, therefore, commit his tank units only if one of his delaying positions has been penetrated before he is ready to give it up, or when he is being sorely pressed between two delaying positions, or in case he has become so involved that he requires a tank attack in order to permit him to break off the engagement. In any event he is not likely to employ his tanks unless absolutely necessary. Such attacks will usually be local.

e. Pursuit is executed by means of marches and attacks with possibly the employment of encircling forces which may act defensively. The conditions to be expected in such operations are, therefore, similar to those to be expected in marches, attacks, and in the defense.

29. PRINCIPLES GOVERNING THE EMPLOYMENT OF ANTI-TANK UNITS.—*a.* A consideration of the types of tank attacks to be expected during offensive operations as outlined above indicates that, in the majority of cases, provision must be made for establishing antitank defense on important tactical localities which have been occupied or captured during the progress of the attack. It may be that there will be no specific missions for the antitank guns of the regiments, other than defense against reconnaissance elements, until the attack has made some progress. Since the hostile

reaction may take place quickly after a success by the attacker, the antitank guns must be able to intervene promptly. These considerations indicate the employment that must be made of the antitank guns. Where the circumstances are such that hostile reconnaissance elements can interfere with the attacker, either on the flanks or to the rear, provision must be made to counter such attempts. In the attack any attempts by small hostile tank detachments will more probably be directed against elements of the division other than the infantry and defense against them will be primarily the function of the division antitank battalion. During the attack the infantry regiments will need their antitank guns for close cooperation in the attack. The protection of rear elements and the flanks will normally be required of the division antitank battalion.

30. EMPLOYMENT OF THE REGIMENTAL COMPANY.—a.

The guns of the regimental company will work in close cooperation with the battalions. Sometimes during the course of the attack, particularly in the case of assault battalions, it may not be practicable for the regimental commander to coordinate the action of the antitank guns directly with that of the battalions. In such cases it may be possible to foresee the progress of the attack and provide for missions for the antitank guns ahead of time. At other times it may be necessary to attach some antitank guns to the battalions, particularly the assault battalions, in order to insure their being on hand at the time and place needed. Other portions of the antitank company may be employed to protect the areas of battalions held in reserve or to take over the defense of captured localities in order to free the guns operating well forward for operation with the advancing infantry. This is particularly true when some of the guns have been attached to assault battalions. If such attachments have not been made the platoons of the antitank company may leapfrog each other so as to insure possession of important tactical localities captured. Either method may involve the occupation of positions in the zone of action of the regiment or along its flanks in such manner as to protect the captured ground and the infantry against hostile tank counterattacks. It is especially necessary during the pauses in the attack which take place incident to reorganization or adjust-

ment that the antitank guns be in position to protect the battalions.

b. It will often not be practicable to give to the company a specific mission in terms of time and terrain or a series of such specific missions. The orders to the antitank company should, however, state the types of missions to be performed and definite instructions regarding the coordination required as the attack progresses should be included. Where several types of missions are assigned it may be necessary to state a priority of time or of importance.

c. On the front of the holding attack extended progress is not usually expected, especially during the initial stages of the attack. Antitank guns of the regiments executing such an attack will be subjected to less demands for pushing forward to participate in the defense of captured terrain. Some of them may be sited for defense on portions of the front of the holding attack where little progress is expected in order to protect against counterattacks delivered for the purpose of disrupting the holding attack. Such counterattacks will usually be infrequent. It should be possible on the front of the holding attack to economize on guns employed well forward sufficiently to provide antitank defense for the rear areas of the holding attack and thus free the division antitank battalion for other work.

31. EMPLOYMENT OF THE DIVISION BATTALION.—*a.* In principle the employment of the division antitank battalion is such as to favor the success of the main attack. This is true even when the battalion is inadequate for all the defensive missions that may be desirable. This means that the division battalion should, as far as possible, take over the defense of the rear areas and the flanks of the main attack force in order to free the regimental guns for close cooperation with the attacking infantry. This will involve the protection of the artillery, important supply establishments, command posts, and the protection of the flanks, and particularly the rear, of the main attack force against counterattacks originating outside of the regimental areas of responsibility. If the flanks of the division are secure, the action of the division battalion may take the form of taking over the protection of captured areas in order to free the regimental companies for employment farther forward.

b. The missions assigned to the division antitank battalion may take the form of the assignment of an area or of particular establishments or terrain features to be defended, these missions being modified according to the progress of the attack. In other cases, especially in obscure situations, it may be possible only to prescribe the types of missions to be executed and the general areas involved. Generally it will not be necessary or practicable to employ the division battalion well forward with the attacking infantry unless the flanks of the division are secure and there is probability of the enemy making frequent and extensive counterattacks with tanks.

c. In executing the missions assigned, the division battalion may, depending on the situation and the terrain, deploy a considerable portion of its guns to cover approaches against raiding detachments, it may dispose the majority of its guns in a defensive position which will secure the area for which it is responsible, or it may hold the bulk of the battalion in readiness to move to meet any threat which may develop. In this latter case only minor detachments are employed at a distance to guard the more important approaches. In open warfare situations where the flanks and rear of the division are exposed the more usual method will be to hold the bulk of the division guns in readiness.

SUPPLY, EVACUATION, AND LOGISTICS

CHAPTER 5

THE ADMINISTRATIVE ORDER AND ADMINISTRATIVE INSTRUCTIONS (The Division)

	Paragraph
Purpose	1
The administrative order and administrative instructions	2
Heading	3
Supply	4
Evacuation	5
Traffic	6
Trains	7
Personnel	8
Miscellaneous	9
Ending	10

1. **PURPOSE.**—The purpose of this chapter is to set forth in detail the items that should be included in the administrative order and administrative instructions for a division. The discussion follows the forms given in *Combat Orders*, The Command and General Staff School. The provisions of this chapter apply with equal force to the reinforced brigade acting independently.

2. **THE ADMINISTRATIVE ORDER AND ADMINISTRATIVE INSTRUCTIONS.**—*a. Definitions.*—An administrative order is the formal expression of those administrative details and supply and evacuation arrangements which the several elements of the command should know. Administrative instructions are likewise a formal expression of those administrative details and supply and evacuation arrangements with which only the services and administrative elements of the command are concerned. Hence, only certain items of the administrative plan appear in the administrative order; the remainder of the items of the

administrative plan appear in administrative instructions. The exact items appearing in each form will not always be the same, because the situation determines what the several elements of the command should know and with what only the services and administrative elements are concerned. Both administrative orders and administrative instructions are types of combat orders.

b. Object.—The object of the administrative order is to transmit to the command that part of the administrative plan with which both combat and service elements are concerned, and to eliminate that part of the administrative plan with which the combat troops have no concern. The object of the administrative instructions is to control and coordinate the activities of the several technical, supply, and administrative agencies of the division wherein the combat elements are not concerned.

c. By whom prepared.—Both the administrative order and administrative instructions are prepared by the G-4 Section of the general staff in the division. Those parts of these orders pertaining to G-1 functions are prepared by the G-1 Section and transmitted to G-4 for incorporation in the orders.

d. Basis.—Administrative orders and administrative instructions are based on the following:

(1) The administrative plans and orders of higher authority.

(2) The administrative plan of the division. A thorough knowledge of the tactical plan is essential to the preparation of a suitable administrative plan. Therefore those charged with its preparation must have the entire confidence of the commander and must consult frequently and cooperate with the members of the general staff sections.

e. How and when issued.—(1) The written administrative order is never issued when its provisions can conveniently be incorporated in paragraph 4 of the written field order. When issued it may or may not accompany a field order. At times it may be a confirmation of notes, messages, or oral instructions issued, from time to time, in conformity with the administrative plan. Frequently, time is not available to issue a written administrative order.

However, when time is available, such an order, incorporating the fragmentary orders issued, should be prepared by G-4 for file with the records of the division. An administrative order is issued when a change in the administrative plan, brought about by a change in the tactical plan or tactical situation of the division, necessitates new instructions to the command. It may also be issued when the preceding administrative order has been so changed by fragmentary orders that a new order is desirable in order that current instructions may be more easily referred to or understood by lower echelons.

(2) Administrative instructions are issued under the same conditions as administrative orders, except that items properly included in administrative instructions are never placed in paragraph 4 of the field order. Although all of the more important items covered by administrative instructions result from recommendations by the special staff officers and decisions by G-4, usually at a special staff conference, the administrative instructions should be published for purposes of confirmation and record.

f. Time required to issue and distribute.—From two to four hours are required to prepare a complete, written administrative order and administrative instructions for a division after the tactical plan is known. Of this time from one to two hours are required to type and mimeograph the orders after the administrative plan has been approved. The usual distribution requires about one hour.

g. Annexes.—(1) These orders may be complete in themselves. However, when necessary to publish details too voluminous for inclusion in the order, any paragraph or subparagraph may be amplified by an annex, such as:

- (a) Administrative map.
- (b) Circulation map.

(2) Annexes covering the following are used frequently to amplify the administrative orders of the army or independent corps, but are seldom necessary in the division:

- (a) Quartermaster plan (includes railhead plan and plan for Class I supplies).
- (b) Ammunition plan.

- (c) Engineer plan.
- (d) Medical plan.
- (e) Ordnance plan.
- (f) Signal plan.
- (g) Aviation plan.

h. Administrative map.—(1) An administrative map is a graphic presentation of the commander's administrative plan placed upon a map through the use of abbreviations and conventional signs. It consists of that part of the administrative plan which can be shown graphically on a map in such detail as will not be confusing. This detail consists of the locations of the supply and evacuation installations, trains, rear echelon, traffic control posts, designation of the main supply road(s), the barrier line forward of which lights will be extinguished, and so much of the tactical plan as is essential to clarify the administrative plan. It may, or may not, include a prescribed road circulation. The use of an administrative map to accompany an administrative order or administrative instructions, completely written or fragmentary, is desirable for the same reason as the use of an operation map with the field order.

(2) When an administrative map is issued in conjunction with an administrative order, the location of installations shown on the map need not be described. A reference is all that is necessary, for example:

"c. Ammunition:

- (1) Refilling point, all classes, opens 1:00 PM (for location see Annex 1).
- (2) Distributing points:
1st Field Artillery (for location see Annex 1)."

When so issued the administrative map is appended to the order to which it pertains as an annex and is always listed as "Annex 1."

i. Circulation map.—A circulation map is a graphical means of describing to the command the traffic circulation and control.

j. Composition.—An administrative order and administrative instructions consist of a heading, a body, and an ending. The body contains the information and instructions concerning supply, evacuation, traffic, trains, and other logistical and administrative items. The amount of detail which should be included in an order is dependent upon the composition, size, and training of the division, the time available, and the situation.

3. **HEADING.**—The heading of each of these orders contains the title (designation of the issuing officer's command); the place, date, and hour of issue; the number of the order and of the field order, if the order accompanies a field order; and reference to the map or maps used.

An example:

"1st Div
House 300 yds southeast of
RJ 629 (365-737) PA,
22 Sept., 1936, 12:30 PM.

ADM O 3: To accompany FO 5.
(or ADM INST 14: To accompany FO 5.)

Maps: Special Map No. 10, Army Extension Courses
(1930), 1:62,500."

4. **SUPPLY.**—Paragraph 1 of the administrative order is headed SUPPLY and contains all the instructions given to the command, as a whole, with respect to supply. Paragraph 1 of the administrative instructions has exactly the same heading but includes only those instructions which are necessary for the service elements of the command.

a. Railhead.—Usually the location and operation of the railhead is of no concern to the combat troops, and therefore this information should be placed in administrative instructions. However, if the field trains are operating under control of their unit commanders and railhead or partial railhead distribution is employed, then information relative to the railhead is of interest to the combat troops and should be placed in the administrative order. The form of the

entry is as follows (administrative order or administrative instructions) :

"a. Railhead:

GETTYSBURG, opening 7:00 PM, 22 Sept.

Daily train arrives 9:30 PM, 22 Sept."

b. Class I supplies.—(1) Distribution.—In situations where all of the field trains are operating under division control, information relative to distribution of Class I supplies will appear in the administrative instructions. If the field trains are released, unit commanders must know how and when the distribution is to be made, consequently this information will appear in the administrative order.

(2) *Issue.*—If the issue of Class I supplies is to be made in the routine way by field trains, this subparagraph will be omitted from both the administrative order and the administrative instructions. However, if the Quartermaster is to make issues to certain units of the division, as for example, those regiments having animal-drawn field trains, the administrative order should contain a statement as to which organizations are to be served and the time at which issues will be completed.

(3) *Special instructions.*—This subparagraph is seldom required in a division administrative order. It may be used to cover unusual methods of supply. For example, if the railhead were at such a distance from the units served that a transfer of Class I supplies was necessary from motor transport of the army to motor transport of the division at an intermediate refilling point, this paragraph might be used to designate the location and time schedule of distribution at the refilling point. Special instructions or policies dictated by higher commanders and of interest only to the services would be placed in the administrative instructions.

(4) A typical entry of this paragraph of an administrative order is as follows:

"b. Class I supplies.

Delivery to unit distributing points to be completed by 1:00 AM, 23 Sept.

Issue to infantry regiments and 1st FA by Quartermaster to be completed by 5:00 AM."

c. Ammunition. — (1) *Refilling point.* — Usually the motorized combat trains of the division refill at the refilling point. Therefore this subparagraph will normally appear in the administrative order. If all classes of ammunition are supplied through a single refilling point, the administrative order should state, "all classes," following the words "refilling point." Otherwise, the particular kinds of ammunition supplied at each refilling point should be stated in the administrative order.

(2) *Distributing points.*—The locations of the distributing points and the organizations served at each of them will habitually be stated in the administrative order. If any or all of the distributing points are not to be in operation at the time the administrative order is issued, the time of opening for each distributing point should be stated.

(3) An example (administrative order) :

"c. Ammunition.

(1) Refilling point: all classes, GETTYSBURG, opening 2:30 PM, 22 Sept.

(2) Distributing points:

(a) Small-arms: 400 yds southwest of CR 733 (366-738).

(b) Artillery:

1st FA, 300 yds north of CR 733 (366-738) ;

2d FA and 3d FA, ammunition refilling point: GETTYSBURG."

d. Water.—(1) *Refilling point.*—If organizations are to draw water at the refilling point, this subparagraph will appear in the administrative order; otherwise, it will appear in the administrative instructions.

(2) *Distributing points.*—The locations of water distributing points and the organizations served at each of them will be stated in the administrative order.

(3) *Special instructions.*—This subparagraph will be used to cover instructions relative to keeping water vehicles filled, condition of water, chlorination, etc. In the administrative order of a cavalry division this subparagraph will

frequently be used to coordinate and control the watering of animals of the division.

(4) An example (administrative order) :

"d. Water.

(1) Distributing points:

1st Brigade: NEW OXFORD.

2d Brigade: BRUSHTOWN.

Other units: BONNEAUVILLE.

(2) Water from local sources will not be used for human consumption."

e. Engineer.—(1) *Refilling point.*—Usually information relative to the refilling point for engineer supplies will appear in the administrative instructions. However, if any organizations are to draw these supplies from the refilling point, this subparagraph will appear in the administrative order.

(2) *Distributing points.*—This subparagraph will include such items as locations, date and hour of opening, organizations served at each of them, and character of supplies provided at each distributing point, if all classes are not to be distributed thereat. It habitually appears in the administrative order.

(3) *Special instructions.*—This subparagraph may be used for the location and description of supplies obtainable locally, such as, lumber, crushed rock, vehicles, barbed wire, tools, hardware, etc. If combat organizations are to procure any of these supplies, this subparagraph will appear in the administrative order.

(4) An example (administrative instructions) :

"e. Engineer.

Refilling point: GETTYSBURG, opening 2:00 PM, 22 Sept."

NOTE.—Refilling points for medical, signal, chemical, aviation, and general quartermaster and ordnance supplies, are usually either corps or army branch depots or stations on the railway where such supplies are made available to the division. The location of these refilling points should be indicated. It is seldom necessary to establish distributing

points for these supplies. Ordinarily, the distribution of these supplies is made at the bivouac areas of the medical regiment, signal company, chemical battalion, quartermaster regiment, and ordnance company, and no reference to this need be made in the administrative order. Air corps supply, for aviation operating with a division, will normally be through a corps or army airdrome.

5. EVACUATION.—Paragraph 2 of the administrative order and administrative instructions is headed EVACUATION and contains instructions for the handling of sick and wounded men and animals; for burial; and for the disposition of salvage, captured enemy material, and prisoners of war.

a. *Casualties.*—(1) *Personnel.* — This subparagraph gives the locations for collecting and hospital stations. Inasmuch as attached medical detachments with the combat troops will frequently obtain certain items of medical supplies from the collecting stations, and evacuation sometimes is effected by such vehicles as trucks of combat trains moving to the rear, this information should be published to the several units of the division and therefore should appear in the administrative order. When a surgical hospital is operating with a division and its location differs from that of the division hospital station, the location is given in the administrative instructions.

(2) *Animals.*—The location of the collecting station for animals is given in the administrative order.

(3) *Special instructions.*—Any special instructions and policies, either of the division commander or higher authority will usually not concern the combat troops and therefore will appear in the administrative instructions.

b. *Burial.*—If organizations are to bury the dead this subparagraph will be included in the administrative order. If the quartermaster is to bury the dead, it will appear in the administrative instructions.

c. *Captured material.*—When applicable this subparagraph will appear in the administrative order, giving dispositions and reports to be rendered.

d. Prisoners of war.—The locations of collecting points and the units served by each will be given in the administrative order. Instructions relative to the evacuation of collecting points by service units will be contained in administrative instructions.

e. An example (administrative order):

"2. EVACUATION.

a. Casualties.

(1) Personnel:

(a) Collecting station: house 700 yards north-east of RJ 707 (367-732).

(b) Hospital station: WHITEHALL (361-745).

(2) Animals:

Collecting station: near road bend (365.5-738.7).

b. Burial.

By organizations.

c. Prisoners of war.

(1) Collecting points: 1st Brig sector, HUMBERT SCHOOL (369-735); 2d Brig sector, RJ (365.5-735.5).

(2) By organizations to collecting points."

6. TRAFFIC.—Paragraph 3 of the administrative order is headed TRAFFIC and contains the necessary instructions concerning the use and maintenance of routes. Commanders issue such orders for the control of traffic as may be necessary to regulate road circulation within their commands. These orders are promulgated as a part of the administrative order; often, by attached circulation maps. Traffic control is the exercise of directive and restrictive authority over movements and direction of travel.

a. Circulation.—The division prescribes circulation in its own area subject to such restrictions as may be in the circulation plan of higher headquarters. In the case of a division acting independently, a prescription as to circulation is usually necessary only when the road net is so poor that the division has not at least one good in-bound and one good out-bound road.

(1) *Designation of the main supply road(s).*—The independent division will not designate a main supply road. When the division is a part of a larger force and the situation requires that main supply roads be designated and maintained, the main supply road for the division is announced in the administrative order.

(2) *Instructions reference motor reserved roads.*—Motor reserved roads are prescribed only when the good roads are so few and the traffic so great that it is essential to keep animal traffic off certain important roads in order to use the roads to maximum capacity. Usually this restriction applies only to the army and, less frequently, to the corps.

(3) *Assignment of routes for special purposes.*—In unusual situations it may, at times, be necessary to assign certain routes for the movement of ammunition carrying vehicles between the ammunition refilling point and distributing points, or for the movement of ambulances between collecting stations and the hospital station.

(4) *Instructions reference marking of routes.*—This subparagraph would be used only in exceptional cases such as warnings against dangerous points or impassable areas, and routes assigned for special purposes. It is not necessary to mention, in the administrative order, the routine marking of routes to show direction of travel and location of command posts and establishments.

(5) *Instructions reference priority of specified classes of traffic.*—During operations the scarcity of good roads will often demand the establishment of priorities for forward movements in order that all traffic congestion may be cleared so as to facilitate the forward movement of vehicles in accordance with probable needs. The desired priorities are stated under this subparagraph of the administrative order.

(6) *See Annex No. ----, Circulation Map.*—In the case of a division acting independently, there will very rarely be need for a circulation map. When the division is part of a larger force the circulation map must conform to the circulation map of the higher echelon.

b. Restrictions.—Traffic is controlled largely by means of restrictions, but since restrictions on freedom of movement

are an annoyance, they should not be imposed unless the advantages outweigh the disadvantages.

(1) *Instructions reference limits of daylight traffic and use of lights.*—In many situations where secrecy or surprise are essential elements of the operation, it will be advisable to designate a barrier line beyond which vehicles of certain classes may not proceed toward the front during daylight hours and beyond which vehicles may not display lights at night.

(2) *Instructions reference distances to be maintained between vehicles, groups of vehicles and troop units.*—At times, in order to minimize hostile observation and opportunity for destruction of convoys, it may be necessary to prescribe increased distances to be maintained between vehicles, groups of vehicles, or troop units.

(3) *Instructions reference disabled vehicles.*—In situations where continuous forward or rearward movement is imperative, it will often be advisable to prescribe that disabled vehicles be removed from the road.

(4) *Instructions reference movement of transportation under escort.*—In situations where all classes of transportation are restricted to movement under escort, it is necessary to prescribe in the administrative order the point at which the convoy is to be assembled (forward initial point) in the combat area, the nature of the escort, times of movement, and other restrictions. Instructions pertaining to the trains operating under division control, restrictions on movement by these trains forward of the rear protected area, the escort to protect the convoy, the rear initial point, etc., should go in the administrative instructions.

c. Control.—*Instructions reference the establishment of traffic control posts and officers' control stations.*—The enforcement of traffic control is a function of the military police under the direction of the provost marshal. The administrative instructions should designate the location of traffic control posts or stations as may be required. In general, only important control posts and stations will be included in the division administrative instructions. The minor control posts, such as those at collecting stations and ammunition distributing points, will be established by the

military police as a routine matter and should not be included in the administrative instructions.

d. Construction and maintenance of routes. — (1) *Roads.*—Road work by a division is usually limited to maintenance of the main routes essential to the supply and evacuation of front-line units. Under this subparagraph of administrative instructions the desired priority in maintenance of roads should be stated.

(2) *Railroads.*—Railroad systems, up to and including the railheads, are operated and maintained by personnel of the communications zone. Rarely will this subparagraph be used in division administrative instructions.

(NOTE. Seldom will there be occasion to use all of the subparagraphs of this paragraph.)

e. An example (administrative order) :

"3. TRAFFIC.

a. Restrictions.

(1) Extinguish vehicle lights southeast of ALLOWAY CREEK.

(2) All vehicles moving from the combat area to the rear will move by convoy and under protection of escort furnished by the 910th Inf (L of C). Convoys will form under direction of the Division Motor Transport Officer at CR 581 (365-755."

7. TRAINS.—Paragraph 4 of the administrative order and administrative instructions is headed TRAINS and contains such instructions as may be necessary for the control of field and service trains. It may also contain instructions relative to combat trains if they are separated from their organizations for purposes of traffic control.

a. Service.—(1) *Instructions reference movement on the march or release from march control; assignment of special missions, when necessary.*—On the march the service trains, less certain elements that may be needed with the troops such as ambulances, are formed into animal-drawn and motor serials, each under a designated serial commander. Under such conditions the trains are under division control

and the service chiefs have no authority over the movements of their respective service trains. When a march table is issued, directions for the movement of service trains would usually be contained therein. If no march table is issued, the location of service train serials in the march columns should be indicated in the administrative instructions. When it is necessary for a service train to perform its usual functions of supply and evacuation, the train should be released and returned to the control of the service chief concerned. A statement under this subparagraph, "service trains are released," is usually sufficient. Special missions may at times be assigned to any of the service trains. For example, a portion of the motor battalion of the quartermaster regiment may be made available at a specified time or held in reserve at a specified place, for the movement of troops by motor transport. This item should appear in the administrative order.

(2) *Instructions reference control in bivouac and assignment of bivouac areas.*—In order to prevent interference with combat troops, and to obtain maximum efficiency from the division as a whole, it is often necessary to coordinate the movements of field and service trains in their bivouac areas by means of restrictions. Particularly is this necessary where secrecy of operations is desired. Examples of such restrictions which may appear under the subparagraph are: instructions to remain in bivouac areas until a certain time, or during daylight; prohibition of movements forward of the bivouac area, except to perform certain supply and evacuation functions; or simply a reference to the general restrictions prescribed in paragraph 3 b of the administrative instructions, if they apply to the service trains. Bivouac areas for the service trains should be designated in the administrative instructions.

b. *Field.*—(1) *Instructions reference movement, release from march control; assignment of special missions, when necessary.*—On the march and frequently during combat, field trains as well as service trains are usually held under division control. At such times the commanders of the organizations to which they belong have no authority over their movements. In order that a field train may perform its usual supply function, it must be released as outlined for

service trains. If the movement of field trains is not covered by a march table this paragraph should contain the necessary assignment to their places in the march columns, and other necessary instructions. The assignment of special missions to field trains is unusual, but motorized field trains will frequently be pooled under division control. Instructions to field trains under division control appear in the administrative instructions. Information relative to release from division control, including location at time of release, should be contained in administrative orders.

(2) *Instruction reference control in bivouac, and assignment of bivouac areas.*—In general, the considerations outlined in paragraph 7 a (2) for control of service trains in bivouac area, also apply to control of field trains. Bivouac areas for field trains, for each regiment, should be prescribed in the administrative order, unless they are held under division control.

c. *Combat.*—Division control of combat trains is exceptional. If employed, instructions and restrictions similar to those outlined in the preceding paragraph for field trains should be stated in the administrative order.

d. An example (administrative instructions):

"4. TRAINS.

a. *Service:*

(1) Released.

(2) Bivouacs:

1st Ord Co, western part of GETTYSBURG.

1st Engrs (C), with the 1st Engrs (C) south of RJ 629 (365-737).

1st QM Regt, southern part of GETTYSBURG.

1st Am Tn, western part of GETTYSBURG.

1st Med Regt, WHITEHALL (361-745).

b. *Field:*

(1) Bivouacs:

1st Inf, along ROCK CREEK north of CULPS HILL (351-748).

2d Inf, along ROCK CREEK south of CULPS HILL.

3d Inf, west of POWERS HILL (351-747).

4th Inf, east of RJ 528 (350-747).

1st FA, along ROCK CREEK east of CULPS HILL.

2d FA, eastern part of GETTYSBURG.

3d FA, eastern part of GETTYSBURG.

Special and attached troops (less detachments)
northern part of GETTYSBURG."

8. **PERSONNEL.**—Paragraph 5 of the administrative order and the administrative instructions is headed **PERSONNEL** and contains instructions with reference to stragglers, surplus baggage, mail, and shelter.

a. Stragglers.—Information with reference to the location of the straggler line and straggler collecting points should go in administrative instructions.

b. Surplus baggage.—Information with reference to the handling packs and extra clothing dumped prior to combat should go in the administrative order. In case transportation of the quartermaster regiment is to be used to transport this baggage, the administrative order should so state and should direct that the regimental supply officers notify the division quartermaster of the packs and extra clothing.

c. Mail.—Instructions with reference to the collection and distribution of mail should go in the administrative order.

d. Shelter.—Instructions with reference to quartering parties and the assignment of troops to existing shelter should go in the administrative order.

e. An example (administrative instructions):

"5. **PERSONNEL.**

a. Stragglers.

(1) Straggler line: the road: RJ (362.2-736.5)—CR 669 (363-735)—RJ (365.5-735.6).

(2) Collecting points:

1st Brig sector, RJ (340.4-736.5);

2d Brig sector, CR 669 (363-735)."

9. MISCELLANEOUS.—Paragraph 6 of the administrative order and the administrative instructions is headed MISCELLANEOUS. It contains details which are of infrequent application or which are not considered of sufficient importance to be placed in a separate main paragraph.

a. *Attachment of service troops.*—The administrative order should state specifically the assignment of such troops as may be attached to combat units. The administrative instructions should show the attachment of service troops to service units of the division.

b. *Rear boundary.*—It is not necessary to designate a rear boundary for a division operating independently. When the division is part of a larger force the corps designates a rear boundary for each of its divisions. This boundary should be repeated in the administrative instructions.

c. *Rear echelon of headquarters.*—The location and hour of opening of the division rear echelon should be stated in the administrative instructions.

d. *Administrative matters not otherwise covered.*—Under this paragraph is stated any administrative information not specifically covered in any preceding paragraphs or not of sufficient importance to be placed in a separate main paragraph, such as the general limits of the rear protected area.

e. *Other administrative details: No change.*—This paragraph calls to the attention of the command the fact that administrative matters already covered in previous administrative orders or administrative instructions and not mentioned in this order, are still in effect.

f. An example (administrative instructions) :

"6. MISCELLANEOUS.

a. Rear echelon DHQ, GETTYSBURG, opening 2:00 PM.

b. Other administrative details, no change."

10. ENDING.—The ending of an administrative order and administrative instructions contains the signature and authentication of the order, list of annexes, and a statement of the distribution. The original order is signed by the chief of staff and copies are made official by the signature of the assistant chief of staff, G-4. It is important that no unit or officer to whom special instructions have been given in the

RML No. 64

administrative order or the administrative instructions be omitted from the distribution. Distribution, as in the case of a field order, is through the message center.

An example:

“By command of Major General A:

X,

C of S.

OFFICIAL:

Y,

G-4.

DISTRIBUTION:

(Here list all units and officers who should receive a copy of the order.)”

COMBAT ORDERS
1936
(Tentative)

THE COMMAND AND GENERAL STAFF SCHOOL
FORT LEAVENWORTH, KANSAS
30 September, 1936

CHANGES)
No. 1 {

Combat Orders, 1936, is changed as follows:

1. In all outlines of orders having under paragraph 3 a lettered subparagraph headed "Artillery", *change the heading to "Field Artillery" and omit the second half of the subparagraph which is headed "Antiaircraft"*.

2. *Immediately preceding the lettered subparagraph of paragraph 3, which is headed Antitank units, insert the following subparagraph:*

"— . Antiaircraft units.—missions for antiaircraft artillery (gun and machine-gun defense to be furnished); missions for units other than antiaircraft artillery assigned exclusively to antiaircraft defense; co-ordination of antiaircraft units (aviation, adjacent antiaircraft units).

3. In all outlines of orders having under paragraph 3 a lettered subparagraph *x*, under the examples given for types of instruction to be included in that subparagraph, *add the following:*

"antiaircraft defense (alarm systems within columns or bivouac areas, use of concealment and camouflage, disposition of units, special use of weapons, establishment of antiaircraft information service observation posts); antimechanized defense (road blocks, demolitions, disposition of units, special use of weapons, etc.)."

[*In order that subscribers may keep their pamphlet *Combat Orders* up-to-date, Changes Nos. 1 and 2 are published. This pamphlet was included as a Supplement to the December 1935 (No. 59) issue of *The Command and General Staff School Quarterly*.—Editor.]

COMBAT ORDERS
1936
(Tentative)

THE COMMAND AND GENERAL STAFF SCHOOL
FORT LEAVENWORTH, KANSAS
1 December, 1936

CHANGES }
No. 2 }

Combat Orders, 1936, is changed as follows:

1. Page 26, first line at top of page;

Before the words the administrative arrangements *insert* the administrative instructions.

2. Page 29, Section IV, to list of contents *add*:

Administrative instructions -----26½

3. Page 32, paragraph 26 *to read*:

26. ADMINISTRATIVE ORDERS.—Administrative orders are used to announce to the command the administrative, supply, and evacuation details which are of interest to the command as a whole.

4. Page 32. After paragraph 26 *add*:

26½. ADMINISTRATIVE INSTRUCTIONS.—Information or instructions of interest to the services only should not be included in the administrative order nor in paragraph 4 of the field order. When the items under consideration consist of statements of policies or instructions of a general nature applicable to the operations of service units over an extended period, or of a specific nature for a particular operation, they should be prepared and issued in the form of administrative instructions.

5. Page 49, subparagraph 41 c (4) *to read*:

(4) *Paragraph 4*.—When data contained in the administrative plan of interest to the command as a whole are not voluminous, they are placed in paragraph 4 of the field order. This will usually be the case in divisions and smaller units. When such data are too voluminous to be contained in paragraph 4 of the field order, or, for any reason, are not available at the time the field order is issued, they will be published to the command as an administrative order, and reference thereto be made in paragraph 4 of the field order.

6. Page 54, paragraph 43 to read:

43. BY WHOM ISSUED.—Administrative orders are issued by armies, corps, divisions, and smaller independent commands, such as the reinforced brigade, when the administrative details of interest to the command as a whole are too voluminous to be contained in paragraph 4 of the field order.

7. Page 54, paragraph 44 to read:

44. BY WHOM PREPARED.—The administrative order, or paragraph 4 of the field order, is prepared in the G-4 Section of the general staff in divisions and higher echelons and by the corresponding sections in lower units. Those parts of the order that may pertain to other staff sections are coordinated and transmitted to G-4 by the chiefs of such staff sections for incorporation in the order.

8. Page 54, subparagraph 45 b to read:

b. The administrative orders of the army are the framework to which the administrative plan of the division must be adjusted. The administrative instructions and orders of the corps are primarily for use of corps troops. The division habitually receives a copy of all army administrative orders. There is but little in the division administrative plan that is based on the corps administrative orders, except when the corps has taken over certain phases of supply which are normal to the army; as when the corps is acting independently or is so far to the front that normal supply from army depots is suspended.

9. Page 55, paragraph 47, line 12:

Starting with The division delete the remainder of the paragraph.

10. Page 55, paragraph 48 to read:

48. AMOUNT OF DETAIL.—When subordinate commanders and troops of a unit are inexperienced, it may be necessary to include in an order many details which would not be included in an order to a well trained and experienced unit. Through training and experience, the handling of many details will become routine. In any situation, only those matters which are of interest to the command as a whole are included in the administrative order or in paragraph 4 of the field order.

11. Page 57, paragraph 51 *to read:*

51. FRAGMENTARY ORDERS.—Frequently in the division or reinforced brigade, the field order is issued in fragmentary form. When this is the case, the information usually placed in paragraph 4, if available at the time the fragmentary orders are prepared, is included. That which is not available at the time the fragmentary orders are issued should be furnished to the units concerned by oral or written messages as soon as it becomes available. Much of this information can be conveniently imparted informally by members of the special staff during contact with corresponding staff officers of lower units. Likewise, instructions to the services will frequently be issued in fragmentary form. For purposes of confirmation and coordination, these fragmentary orders to the services may be published as soon as practicable in the form of administrative instructions.

12. Page 58, subparagraph 52 *b to read:*

b. When an administrative map is issued in conjunction with an administrative order, the location of installations shown on the map need not be described. A reference is all that is necessary. When issued, the administrative map is appended to the order to which it pertains as an annex and is always listed as "Annex 1."

13. Page 73, Section IX, to list of outlines *add after* OUTLINE FOR ADMINISTRATIVE ORDER:

OUTLINE FOR ADMINISTRATIVE INSTRUCTIONS ----- 138a

14. Pages 135 to 138 inclusive. *Delete and substitute therefor:*

COMBAT ORDERS

135

**An Outline of an
ADMINISTRATIVE ORDER**

Title

Place

Date and Hour

To accompany FO —¹

ADM O —

Maps:

1. SUPPLY.

*a. Railhead.*²—Location, hour and date of opening, and hour of arrival of daily train, when change of railhead is involved. (In a division administrative order, the railhead will not be mentioned unless railhead distribution is to be used and field trains are released from division control.)

b. Class I supplies:

(1) Method of distribution, if all or part of the field trains are released. (Location of distributing points, organizations served at each, and time schedule of distribution, when required.)

NOTE.—Time schedule for distribution to army troops is frequently published as an annex to the army administrative order.

(2) Method of issue, if issues are not to be made by released field trains. (Organizations to be served and times at which issues will be completed.)

(3) Special instructions. (Seldom with a division.)

(4) See *Annex No. —, Plan of Class I Supply.* (Army, and less frequently the detached corps.)

c. Ammunition:

(1) Refilling point(s).—(All classes, or designation of kind served at each.) Location, hour, and date of opening.

(2) Distributing points.—(Small-arms and artillery.) Organizations served at each, locations, and

COMBAT ORDERS

time of opening if opening is to be at an hour subsequent to time order is issued.

- (3) See *Annex No. —, Plan of Ammunition Supply*. (Army, and less frequently, detached corps.)

d. *Water*:

- (1) Refilling point(s).²—Location, hour and date of opening. (For division, need not be mentioned unless specified units are to draw at the refilling point.)
- (2) Distributing points.—Organizations served at each and locations.
- (3) Special instructions, when necessary.

e. *Engineer supplies*:

- (1) Refilling point(s).—Designation of character of supplies at each. Location, hour, and date of opening, when necessary. (For division, will not be mentioned.)
- (2) Distributing point(s).—(When necessary.) (Organizations served at each, location, hour, and date of opening, if opening is to be at an hour subsequent to time order is issued.)
- (3) Special instructions, when necessary.

NOTE.—Subparagraphs similar to c, d, and e, reference refilling and distributing points for medical, signal, chemical, air corps, and other quartermaster and ordnance supplies are added as necessary.

2. EVACUATION.

a. *Casualties*:

- (1) Personnel:
- (a) Collecting station(s), locations. (Division.)
- (b) Hospital station(s), location. (Division and corps.)
- Hospitals, evacuation and convalescent, locations. (Army and corps.)
- (2) Animals:
- (a) Collecting station(s), location. (Division and corps.)
- (b) Hospitals: Evacuation, location. (Army.)
- (3) See *Annex No. —, Medical Plan*. (Army, and less frequently the independent corps.)

COMBAT ORDERS

137

- b. *Burial*.—Instructions reference burial and reports, locations of cemeteries. (For division, do not mention unless burial is to be accomplished by organizations.)
- c. *Captured material*.—Instructions reference dispositions and reports.
- d. *Prisoners of war*.—Collecting points; units served by each and locations. (For corps and army: Instructions as to responsibility for evacuation and reports.)

3. TRAFFIC.

a. *Circulation*:

- (1) Designation of main supply road(s). (Not designated for independent brigade or independent division.)
- (2) Instructions reference motor reserved roads, when necessary.
- (3) Assignment of routes for special purposes, when necessary.
- (4) Instructions reference marking of routes, when necessary.
- (5) Instructions reference priority of special classes of traffic; as ambulances, ammunition, signal, and engineer vehicles, when necessary.
- (6) See *Annex No. —, Circulation Map*, when issued.

b. *Restrictions*:

- (1) Instructions reference limits of daylight traffic and use of lights, when necessary.
- (2) Instructions reference distance to be maintained between vehicles, groups of vehicles, and troop units, when necessary.
- (3) Instructions reference disabled vehicles, when necessary.
- (4) Instructions reference movement of transportation under escort and location of FIP (forward initial point).

c. *Construction and maintenance of routes*:

- (1) Coordination with road and railroad work of higher and lower units.

138

COMBAT ORDERS

4. FIELD TRAINS.

- a. Instructions reference movement, release from march control; assignment of special missions, when necessary.
- b. Instructions reference control in bivouac, and assignment of bivouac areas, when not under division control.

5. PERSONNEL.

- a. *Stragglers*.—Coordination on boundaries of subordinate units, when necessary. (Army and corps only.)
- b. *Surplus baggage*.—Instructions reference disposition. (Usually refers to packs and extra clothing.)
- c. *Mail*.—Instructions reference collection and distribution.
- d. *Shelter*.—Instructions reference quartering parties.

6. MISCELLANEOUS.

- a. *Attachment of service troops*.—Instructions reference attachment of service troops to subordinate units, when necessary.
- b. *Rear boundary*.—Location and time when effective. (Army and corps.)
- c. *Rear echelon of headquarters*.—Location and hour of opening. (Army and detached corps.)
- d. *Administrative matters not otherwise covered*.—Administrative matters of interest to the command as a whole which do not belong in any of the preceding paragraphs should be included here.

(Signature)

(Authentication)

Annexes:

Distribution:

NOTES

¹When field orders make changes in the administrative and supply situations, and are to be accompanied by administrative orders, these administrative orders should include only the necessary changes, referring to previous administrative orders in force for other details or stating in the "MISCELLANEOUS" paragraph, "Other administrative details: no change."

²The term "refilling point" is used when Class I supplies are delivered at points not on a railroad.

³Used only when water must be brought into the area in the same manner as other supplies (exceptional).

15. Following page 138 add the following as pages 138a, 138b, and 138c.

COMBAT ORDERS

138a

An Outline of
ADMINISTRATIVE INSTRUCTIONS

Title

Place

Date and Hour

ADM INST ——. (If issued in connection with a FO make reference to that FO.)

Maps:

1. SUPPLY.

a. *Railhead*.—Location, hour and date of opening, and hour of arrival of daily train, when change of railhead is involved. (Division and reinforced brigade, except when this information is included in paragraph 4 of the field order or in the administrative order.)

b. *Class I supplies*:

(1) Method of distribution, when field trains are not released. (Location of distributing points, field trains served at each, and time schedule of distribution, when required.)

(2) Special instructions, when necessary.

c. *Water*:

(1) Refilling point(s).—Location, hour, and date of opening. (Division, when necessary and when omitted from paragraph 4 of field order or from administrative order.)

(2) Special instructions, when necessary.

d. *Engineer supplies*:

(1) Refilling point(s).—Designation of character of supplies at each (when necessary); location, hour, and date of opening. (Division.)

(2) Special instructions, when necessary.

NOTE.—Subparagraphs similar to c and d, reference refilling points for medical, signal, chemical, and other quartermaster and

1386

COMBAT ORDERS

ordnance supplies are added for the division as necessary.

2. EVACUATION.

- a. *Casualties*.—Special instructions or policies not contained in administrative orders.
- b. *Burial*.—Instructions reference burial and reports, location of cemeteries. (Division, unless burial is by organizations.)
- c. *Salvage*.—Instructions reference collection, disposition and reports.
- d. *Prisoners of war*:
 - (1) Location of inclosures. (Army and corps.)
 - (2) Special instructions, when necessary.

3. TRAFFIC.

- a. *Restrictions*.—Instructions reference movement of transportation under convoy, elements to be convoyed, and RIP (rear initial point).
- b. *Control*.—Locations of traffic control posts, and officers' control stations, when necessary.
- c. *Construction and maintenance of routes*:
 - (1) *Roads*.—Instructions reference priority of work on roads and bridges; general character of maintenance; bridge loads.
 - (2) *Railroads*.—Same general character of instructions as for roads, including yards and sidings. (Army, and less frequently, detached corps.)
 - (3) See *Annex No. —, Engineer Plan*. (Army, and less frequently, detached corps.)

4. TRAINS.

- a. *Service*:
 - (1) Instructions reference movement on the march or release from march control; assignment of special missions, when necessary.
 - (2) Instructions reference control in bivouac and assignment of bivouac areas.
- b. *Field*.—(When not released.)
 - (1) Instructions reference movement, and assignment of special missions, when necessary.
 - (2) Instructions reference control in bivouac and assignment of bivouac areas.

COMBAT ORDERS

138c

5. PERSONNEL.

a. Stragglers:

(1) Straggler line.—Location.

(2) Collecting points.—Location.

b. Special instructions, when necessary. (Requisitioning, receiving, and assigning replacements.)

6. MISCELLANEOUS.

a. Movement of service troops.—Instructions covering changes of location in rear areas usually refer to troop movement table. (Army, less frequently, detached corps.)

b. Rear boundary.—Location, and time when effective. (Division.)

c. Protected areas (or zones in large commands).—Locations, giving boundaries of protected areas or zones.

d. Rear echelon of headquarters.—Location, and hour of opening. (Division.)

e. Administrative instructions not otherwise covered.

f. Other administrative instructions.—No change, when applicable.

(Signature)

(Authentication)

Annexes:

Distribution:

16. Page 146, the last word in the first line of the heading to read *an*.

17. Page 147, substitute the following *Transportation Groupings* for those shown for the *1st Quartermaster Regiment* and the *1st Medical Regiment*.

<i>1st QM</i>		
B	QM-1	Hq and Hq Co, $\frac{1}{2}$ Co F, 1st QM Regt.
B	QM-2	$\frac{1}{2}$ Hq 1st Bn, $\frac{1}{2}$ Co A, $\frac{1}{4}$ Co S 1st QM Regt.
B	QM-3	$\frac{1}{2}$ Hq 1st Bn, $\frac{1}{2}$ Co A, $\frac{1}{4}$ Co S 1st QM Regt.
B	QM-4	$\frac{1}{2}$ Co B, $\frac{1}{4}$ Hq 3d Bn, $\frac{1}{4}$ Co E 1st QM Regt.
B	QM-5	$\frac{1}{2}$ Co B, $\frac{1}{4}$ Hq 3d Bn, $\frac{1}{4}$ Co E 1st QM Regt.
B	QM-6	$\frac{1}{2}$ Hq 2d Bn, $\frac{1}{2}$ Co C, $\frac{1}{4}$ Co S 1st QM Regt.
B	QM-7	$\frac{1}{2}$ Hq 2d Bn, $\frac{1}{2}$ Co C, $\frac{1}{4}$ Co S 1st QM Regt.
B	QM-8	$\frac{1}{2}$ Co D, $\frac{1}{4}$ Hq 3d Bn, $\frac{1}{4}$ Co E 1st QM Regt.
B	QM-9	$\frac{1}{2}$ Co D, $\frac{1}{4}$ Hq 3d Bn, $\frac{1}{4}$ Co E 1st QM Regt.
<i>1st Med</i>		
B	Med-1	Co A, Co G, dets of: Hq 1st Bn, Hq 3d Bn, Serv Co, Vet Co, Hq 1st Med Regt, Div Surg Off.
B	Med-2	Co E, $\frac{1}{2}$ Co D, $\frac{1}{2}$ Hq 2d Bn 1st Med Regt.
B	Med-3	Co B, Co H, dets of: Hq 1st Bn, Hq 3d Bn, Serv Co, Vet Co, Hq 1st Med Regt, Div Surg Off.
B	Med-4	Co F, $\frac{1}{2}$ Co D, $\frac{1}{2}$ Hq 2d Bn, 1st Med Regt.
B	Med-5	Co C, Co I, dets of: Hq 1st Bn, Hq 3d Bn, Serv Co, Vet Co, Hq 1st Med Regt, Div Surg Off.

18. In all outlines of orders given in Section IX, having under paragraph 3 a lettered subparagraph headed "Aviation" delete the subparagraph given and substitute the following:

"— Aviation:

(1) Air Service.—

(a) Observation Squadron or Group [less any squadron(s) or flight(s) attached to subordinate units]: coordination with aviation of higher and lower units or naval aviation; air areas; battle or special missions or airplanes to be held on call (with date and hour) for battle or special missions; landing field(s) established and hour they will be available; designation of airplanes to operate from landing field(s); location of airdrome (if not previously given in Field Orders). Refer to *Intelligence Annex* if issued.

- (b) Balloon Squadron or Group [less squadron(s) attached to subordinate units]: directions as to location or movement; observation to be performed; initial ascension point(s); any instructions as to time of inflation of balloon(s) or other measures for secrecy. Refer to *Intelligence Annex* if issued.

(NOTE.—G-2 assigns to the Air Service all missions concerned with the collection of enemy information by either a fragmentary order or an *Intelligence Annex*, and therefore such missions do not appear in the Field Order.)

- (2) Combat Aviation.—Missions. Refer to *Combat Aviation Annex*."

19. The model orders shown in paragraph 54 f (3), page 67; paragraph 54 f (10), page 68; and paragraph 54 g, page 69, *Combat Orders, 1936 (Tentative)* will be changed to correspond with the provisions of paragraph 18 above and with the provisions of Changes No. 1, *Combat Orders, 1936 (Tentative)*, 30 September, 1936.

LIST OF TEXTBOOKS

The following books and pamphlets are used for instructional purposes at The Command and General Staff School and may be obtained from the Book Department:

General Tactical Functions of Larger Units, 1927
Reference Data, 1936
Tables of Organization, 1936
Combat Orders, 1936
Tactics and Technique of Engineers, Table of Contents (1929), Chapters I (1929), II (1929), III (1932), IV (1932), V (1929), VI (1929), VII (1929), VIII (1935) and Appendices (1929).
Tactics and Technique of the Quartermaster Corps, 1935 and Changes No. 1 to Chapter IV
Command, Staff, and Logistics, Chapters I (1934) and Changes No. 1, II (1934), III (1934), IV (1936), VI (1936), VII (1934), VIII (1934) and Changes No. 1, IX (1936), and X (1935).
Military Aid to the Civil Power, 1925
Manual for Commanders of Large Units, Volume II (1936)
Attack, 1936
Defense, 1936
Reconnaissance, Security, Marches, Halts, 1936
Psychology and Leadership—Burns
Special Operations, 1936
Tactics and Technique of Infantry, 1936 and Changes No. 1
The Tactical Employment of Field Artillery, 1936
The Tactical Employment of Cavalry, 1936
Military Intelligence, 1936
Tactics and Technique of Chemical Warfare, 1935
Command and Staff Liaison, 1936
Field Engineering, Terrain, Chapters I (1934), IV (1934), V (1935), VI (1934), VIII (1935), and XI (1935), Appendix 2 (1935).
Signal Communications, Division and Reinforced Brigade, 1934
Tactics and Technique of the Air Corps, Chapters I (1936), II (1936), III (1936), IV (1936), V (1935), VI (1929), VII (1929), VIII (1929), IX (1929), X (1929), and XI (1929).
The Principles of Strategy, 1936
Cannae—von Schlieffen—Text & Maps, Revised edition
Marne Campaign, 1914.—von Kuhl

Section 6

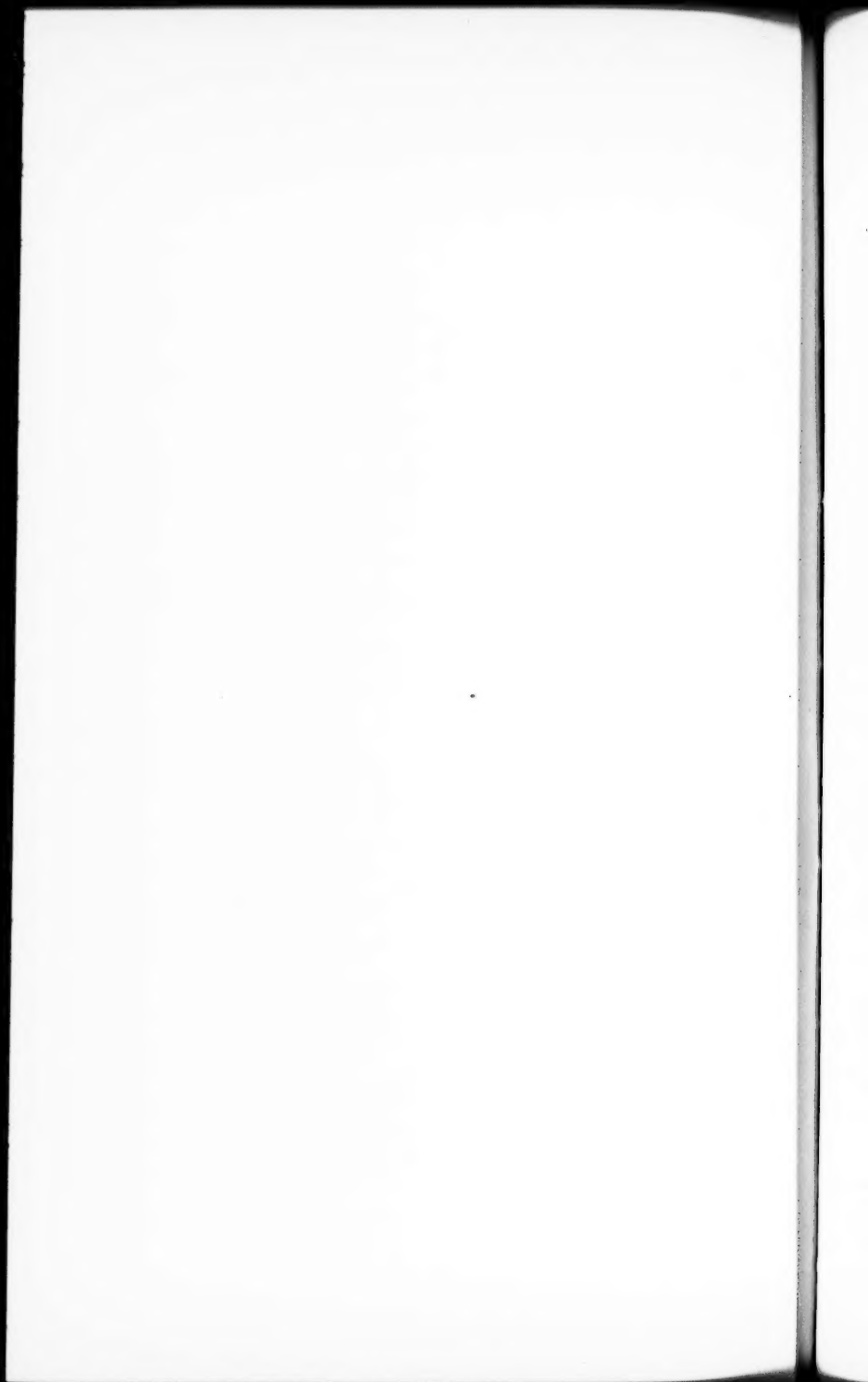
LIBRARY BULLETIN

BOOKS ADDED TO THE LIBRARY SINCE DECEMBER, 1936

- Abend, Hallett.—**Can China survive?** 1936 [951-A]
- Academy of Political Science.—**The Constitution and social progress.** (The Proceedings of the Academy of Political Science, Vol. XVI, January 1936.) 1936 [342.73]
- Ackerman, Dr. Wolfgang.—**And we are civilized!** 1936 [M 9403-B4.436]
- v. Altrock, Lt. Gen. Constantin.—**Tactics and troop leading with examples from military history.** (Translation from the German) 1936 [M 503-A8.43]
- American Academy of Political and Social Science:
The attainment and maintenance of world peace. (The Annals, July 1936) 1936 [M 004-A]
The Constitution of the 20th Century. (The Annals, May 1936) 1936 [342.733]
Problems of organized labor. (The Annals, March 1936) 1936 [331.88]
- American Stud Book.** Volumes XV and XVI and First Supplement to Volume XVI. 1936 [636.13]
- Bernstorff, Count.—**Memoirs of Count Bernstorff.** (Translation from the German) 1936 [M 943-B92 (BE)]
- Brock, D.W.E.—**The A B C of foxhunting.** A handbook for beginners. 1936 [799.25]
- Carnegie, Dale.—**How to win friends and influence people.** 1936 [137]
- de Caulaincourt, General.—**No peace with Napoleon!** Concluding the memoirs of General de Caulaincourt, Duke of Vicenza. Vol. II. 1936 [M 94405-J5-G1.44]
- Clapham, Richard.—**The book of the fox.** 1936 [799.25]
- Dictionary of American Biography.** Vol. XX: Werden-Zunser. 1936 [973-B920]
- Duffour, Colonel.—**The War, 1914.** (Course in History, Ecole Supérieure de Guerre.) (In 2 volumes) (Translation from the French) 1936 [M 9403-E4-D.44-C]
- Eitzen, Kurt Hilmar.—**Deutsch-englisches, englisch-deutsches Militär-Wörterbuch.** [German-English, English-German military dictionary.] 1936 [M 202-R.73.43]
- Encyclopaedia Britannica.** New 14th Edition. 1936 (In 24 volumes) [032]
- Encyclopedia of Canada.** Vol. IV: Lauzon—New Toronto. 1936 [971]
- Escale, Lieutenant C.P.—**The marches of the Armies of Napoleon.** (Translation from the French) 1936 [M 94405-H3-J3]
- Federal Digest.** 1936 Annual. 1936 [345.5]
- Federal Reporter.** Second series. Vol. 84 (2d): July-September 1936; Vol. 85 (2d): October-December 1936. 1936 [345.41]
- Federal Supplement.** Vol. 15: July-November 1936. 1936 [345.41]
- Gackenholtz, Hermann.—**The decision in Lorraine in 1914.** The plan of operation of von Moltke and its execution by the German left flank. (Translation from the German) 1936 [M 9403-H1-D.43]
- Gannes, Harry.—**Spain in revolt.** 1936 [M 946-A]
- de Gaulle, Colonel.—**Vers l'armée de métier.** [Why a professional army?] 1934 [M 203-C.44-A]
- Gazin, Major.—**Lost opportunities.** (Translation from the French) 1936 [M 9403-G6-C.44]
- Germany. Marinearchiv.—**The War at sea, 1914-1918.** Battles of the Imperial Navy in the German colonies. Part I: Tsingtau. (Translation from the German) 1936 [M 9403-L8]
- Germany. Reichsarchiv.—**The World War, 1914-1918.** Vol. II: The liberation of East Prussia. Third part: The Battle of Tannenberg. (Translation from the German) 1936 [M 9403-E4-E.43-C]
- Grasset, Colonel A.—**Les Marais de Saint-Gond, 5-10 septembre 1914.** [The battle of the marshes of Saint-Gond, 5-10 September 1914.] 1936 [M 9403-J.44:4N5M]

- Groener, General Wilhelm.—**The testament of Count Schlieffen.** (Translation from the German) 1936 [M 9403-H1-D.43]
- Hamilton, Count Gilbert.—**In the field.** (Translation from the Swedish) 1936 [M 9403-J.47:8-T]
- Healy, Dr. Thomas H.—**Handbook of national defense and peace.** 1936 [M 103-C.73-A]
- Herbillon, Colonel.—**From the Meuse to Rheims.** General A. Micheler. (Translation from the French) 1936 [M 9403-E4-D.44-B92 (MI)]
- Hervy, John.—**American race horses, 1936.** A review of the breeding and performances of the outstanding thoroughbreds of the year engaged in racing, steeplechasing and hunt races. 1936 [M 403-G1.73]
- Italy. Third Army.—**Some lessons of the defensive battle of the Piave, 15-24 June 1918.** (Translation from the Italian) 1936 [M 9403-H6-C.45-E3-C3D]
- Jochim, Oberst Theodor.—**Operations and rearward lines of communications of the German First Army during the battle of the Marne, 1914.** (Translation from the German) 1936 [M 9403-J.44:4N5.43]
- Joguet, Major A.—**Through the gap from Belfort to Mulhouse (August 1914).** (Translation from the French) 1936 [M 9403-J.44:4-C]
- Johnson, J.H.—**"The Laughter Library."** 1936 [817]
- Leader, Major W.K.M.—**An elementary study of appreciations, orders and messages.** 1936 [M 505-F1-C.42]
- League of Nations:
Armaments Year-Book, 1936. 1936 [M 104-A6]
Statistical Year-Book of the League of Nations, 1935-1936. 1936 [M 104-A6]
- Library of Congress.—**Report of the Librarian of Congress for the fiscal year ending June 30, 1936.** 1936 [027.73]
- Lindsell, Colonel W.G.—**Military organisation and administration.** (New Edition) 1935 [M 206-C.42-A]
- Lloyd George, David.—**War memoirs of David Lloyd George.** Vol. VI. 1936 [M 942-B92 (L1)]
- Lyon, Major W.E.—**"In my opinion. —"** Being a book of dissertations on horses and horsemanship. 1931 [M 403-G1.73]
- Millard, Oscar E.—**Burgomaster Max.** 1936 [M 9403-E4-D.494-B92 (MA)]
- Morrow, Ian F.D.—**The peace settlement in the German Polish borderlands.** A study of conditions today in the pre-war Prussian Provinces of East and West Prussia. 1936 [M 943-A]
- Mottram, R.H.—**Journey to the Western Front.** Twenty years after. 1936 [M 9403-J.44:4]
- Nevins, Allan.—**Hamilton Fish; the inner history of the Grant administration.** 1936 [M 973-B92 (F1)]
- Newlands, Francis G.—**The public papers of Francis G. Newlands.** (In 2 volumes.) 1932 [973-A]
- Normand, Colonel Robert.—**River crossings in the presence of the enemy.** (Translation from the French) 1936 [M 503-M1]
- Novikoff-Priboi, A.—**Tsushima.** (Translation from the Russian) 1936 [M 952-066-L8-D]
- Nowak, K.F.—**The defeat as viewed from the other side.** (Der Weg zur Katastrophe). (Translation from the French) 1936 [M 9403-C5]
- Pétain, Marshal.—**Pétain's report.** Vol. VI: The battle of the Champagne, 30 June—18 July 1918. (Translation from the French) 1936 [M 9403-H6-C.44-C1D]
- Quiroz, Lt. Alfonso C.—**The transporting of a division by railway from the city of Puebla to Tapachula, Mexico.** A concrete case. (Translation from the Spanish) 1936 [M 504-D4]
- von Poseck, General.—**The German Cavalry in Poland, 1914-1915.** (Translation from the German) 1936 [M 9403-G6-C.43-A]
- Rebold, Colonel J.—**La Guerre de Forteresse 1914-1918.** [The fortress battles of 1914-1918.] 1936 [M 9403-H3-F1-C]
- Reilly, Maj.Gen. Henry J.—**Americans all—The Rainbow at war.** Official history of the 42nd Division in the World War. 1936 [M 9403-G4-C.73-A5]
- Rougeron, C.—**L'Aviation de bombardement.** [Bombardment aviation.] (In 2 volumes.) 1936 [M 409-E.44-F]
- Rouquerol, General.—**Le Chemin des Dames 1917.** [The Chemin des Dames, 1917.] 1934 [M 9403-J.44:7N8]
- Schwarz, General Alexis V.—**Fortresses before, during and after the World War.** (Translation from the Spanish) 1936 [M 604-C3-A]

- Schwien, Major Edwin E.—**Combat intelligence.** Its acquisition and transmission. 1936 [M 505-E3-A.73]
- Second Army Headquarters.—**Report of Second Army maneuvers, 1936.** (In 15 volumes) 1936 [M 506-A7-D9.73]
- Sikorski, General L.:
La Guerre Moderne. Son caractère. Ses problèmes. [The modern war. Its characteristics and problems.] 1935 [M 501-A.44]
The Russo-Polish War, 1920. (Translation from the French) 1936 [M 9438-051]
- Smedley, Agnes.—**China's Red Army marches.** 1936 [M 951-A]
- Sperry, Armstrong.—**Wagons Westward.** The old trail to Santa Fe. 1936 [978]
- Statistisches Jahrbuch für das Deutsche Reich.** [Statistical yearbook for Germany, 1936.] 1936 [943]
- Stewart, F.A.—**Hunting countries.** 1936 [799.25]
- Stringfellow, Captain John S.—**Hell! No!** This and that. A narrative of the Great War. 1936 [M 9403-B4.73]
- von Ungern-Sternberg, Dr. Leonie.—**War in China.** The civil war in China and the Chinese-Japanese conflict. (Translation from the German) 1936 [M 951]
- United States Supreme Court Reports.** Vol. 297: Cases adjudged in the Supreme Court at October term, 1935. 1936 [345.4]
- Volkmann, Colonel Hellmuth.—**Befehlstechnik.** Winke und Anregungen für ihre Anwendung im Rahmen der Division und des verstärkten Regiments. [Technique of orders. Hints and suggestions for use in preparation of orders for the division and the reinforced regiment.] 1936 [M 505-F1.43]
- War Department:
Report of the Chief of Engineers, U.S. Army, 1936. (In 2 volumes) 1936 [M 410-C.73-D]
Report of the Secretary of War to the President, 1936. 1936 [M 205-C.73-E1-D]
Report of the Surgeon General, U.S. Army, to the Secretary of War, 1936. 1936 [M 421-C.73-D]
- Wehr, Rudolf von.—**Tannenberg.** How Hindenburg defeated the Russians. (Translation from the German) 1936 [M 9403-J.47-4-R4]
- Westarp, Graf von.—**Oertzenscher Taschenkalender für die Offiziere des Heeres.** [Handbook for the German Army.] 1937 [M 209-C.43-C]
- Weyers Taschenbuch der kriegsflotten.** XXXI Jahrgang, 1937. [Handbook of the battle fleets, 1937.] 1937 [M 8205-A.43]
- Wheeler, Bennett, J.W.—**Hindenburg—The wooden titan.** 1936 [M 9403-E4-E.43-B92 (HI)]
- Woldman, Albert A.—**Lawyer Lincoln.** 1936 [973-B92 (LI)]
- Woodward, W.E.—**A new American history.** 1936 [M 973-A]



Section 7

READERS' GUIDE AND SUBJECT INDEX

- | | |
|--|--|
| <p>A</p> <ul style="list-style-type: none"> Aerial Warfare Air Arm Ammunition Animals Antiaircraft Artillery Antiaircraft Defense Antigas Antitank Applicatory Exercises Armaments Armies (See country) <ul style="list-style-type: none"> Command & Staff Mobilization Organization & Equipment Training Armored Cars Art of War Strategy Artillery (Other Arms, similarly) <ul style="list-style-type: none"> Command & Staff Organization & Equipment Training Tactics Attack <p>B</p> <ul style="list-style-type: none"> Breakthrough Operations <p>C</p> <ul style="list-style-type: none"> Camouflage Cavalry Chemical Warfare Service Civilian Conservation Corps Coast Artillery Command, Staff & Logistics Counterattack <p>D</p> <ul style="list-style-type: none"> Defiles Delaying Action Disarmament <p>E</p> <ul style="list-style-type: none"> Engineers Envelopment Equitation <p>F</p> <ul style="list-style-type: none"> Fire Superiority Flank Operations Formations, Battle Fortifications France (Army of) Future Warfare <p>G</p> <ul style="list-style-type: none"> Gas & Smoke (Use of) Geography (Military) Germany (Army of) Great Britain (Army of) <p>H</p> <ul style="list-style-type: none"> History (General) <p>I</p> <ul style="list-style-type: none"> Infantry Intelligence (Military) International Relations Italy (Army of) <p>J</p> <ul style="list-style-type: none"> Japan (Army of) Joint Operations <p>K</p> <ul style="list-style-type: none"> <p>L</p> <ul style="list-style-type: none"> Large Units, Organization & Tactical Functions (Army, Corps & Division) Law, Military & International Leadership Liaison <p>M</p> <ul style="list-style-type: none"> Machine Guns Maneuvers Map Problems | <ul style="list-style-type: none"> Marches Marine Corps Mechanization Medical Service Meeting Engagement Mining Mobile Warfare Mobility Mobilization Motorization <p>N</p> <ul style="list-style-type: none"> National Defense Naval Warfare Navies (See country) Night Operations <p>O</p> <ul style="list-style-type: none"> Obstacles Ordinance Service Organization Overseas Expeditions <p>P</p> <ul style="list-style-type: none"> Penetration Position Warfare Principles of War Pursuit <p>Q</p> <ul style="list-style-type: none"> Quartermaster Service <p>R</p> <ul style="list-style-type: none"> Raids Reconnaissance Riots River Crossings Routes Communications <p>S</p> <ul style="list-style-type: none"> Security Signal Service Supply <p>T</p> <ul style="list-style-type: none"> Tactics Operations <ul style="list-style-type: none"> Evolution of Tactics General topics Defensive combat Offensive combat Special warfare Troop movements <p>Tanks</p> <ul style="list-style-type: none"> Technology Terrain Topography Surveying Transportation Turning Movements <p>U</p> <ul style="list-style-type: none"> United States (Army of) <p>V</p> <ul style="list-style-type: none"> Veterinary Service <p>W</p> <ul style="list-style-type: none"> War Peace Wars (Ancient, Medieval, Modern) <ul style="list-style-type: none"> World War <ul style="list-style-type: none"> C—Socio-Economic History E—General Military History F—Zone of Interior G—Arms & Services H—Military Conduct of the War in the Field J—Campaigns & Battles L—Naval History <p>Weapons</p> <ul style="list-style-type: none"> Withdrawal |
|--|--|

**List of Periodicals Indexed
and
Key to Abbreviations**

A Med Bul —Army Medical Bulletin	Mil Surg —Military Surgeon
AN&AF Gaz —Army, Navy & Air Force Gazette (Great Britain)	Nav Inst Proc —Naval Institute Proceedings
A Ord —Army Ordnance	Pion —Pioniere (Germany)
A Quar —Army Quarterly (Great Britain)	QM Rev —Quartermaster Review
Bul Belge Mil —Bulletin Belge des Sciences Militaires (Belgium)	Res Off —Reserve Officer
Can Def Quar —Canadian Defence Quarterly (Canada)	Rv l'Air —Revue de l'Armée de l'Air (France)
Cav Jour —Cavalry Journal	Rv d'Art —Revue d'Artillerie (France)
Chem War —Chemical Warfare Bulletin	Rv de Cav —Revue de Cavalerie (France)
CA Jour —Coast Artillery Journal	Rv d'Inf —Revue d'Infanterie (France)
FA Jour —Field Artillery Journal	Rv Gen Mil —Revue du Génie Militaire (France)
Ftg Forc —Fighting Forces (Great Britain)	Rv Mil Fran —Revue Militaire Française (France)
Inf Jour —Infantry Journal	Rv Mil Suisse —Revue Militaire Suisse (Switzerland)
Jour RAMC —Journal of the Royal Army Medical Corps (Great Britain)	Riv Art e Gen —Rivista di Artiglieria e Genio (Italy)
Jour R Art —Journal Royal Artillery (Great Britain)	RAF Quar —Royal Air Force Quarterly (Great Britain)
Jour RUSI —Journal of the Royal United Service Institution (Great Britain)	RASC Quar —Royal Army Service Corps Quarterly (Great Britain)
Jour USII —Journal of the United Service Institution of India (Great Britain—India)	Roy Eng Jour —Royal Engineers Journal (Great Britain)
MC Gaz —Marine Corps Gazette	Sanct Chris —Sanct Christophorus (Germany)
Mil Mitt —Militärwissenschaftliche Mitteilungen (Austria)	SC Bul —Signal Corps Bulletin
Mil-Woch —Militär-Wochenblatt (Germany)	Vet Bul —Veterinary Bulletin
Mil Eng —Military Engineer	Ws & Wr —Wissen und Wehr (Germany)
	For Aff —Foreign Affairs

Jan—January
Feb—February
Mar—March
Apr—April
May—May
Jun—June

Jul—July
Aug—August
Sep—September
Oct—October
Nov—November
Dec—December

A

AERIAL WARFARE

The air-sea war in Flanders. (Rv l'Air—Jul 1936)
 The reality of airship vulnerability. (AN&AF Gaz—29 Oct 1936)
 Military geography and aerial warfare. (AN&AF Gaz—24 Dec 1936)
 The Douhet doctrine. (AN&AF Gaz—7 Jan 1937)
 War in the air. (Ftg Forc—Dec 1936)
 Aircraft versus warships: a summing up. (Jour RUSI—Nov 1936)
 The airplane in international law. (Nav Inst Proc—Nov 1936)
 Views on air defence. (RAF Quar—Jan 1937)
 Canada and war in the air. (RAF Quar—Jan 1937)

AIR ARM

Command and Staff

The aircraft factor in war. (AN&AF Gaz—19 Nov 1936)

Organization and Equipment

Two viewpoints of the policy of the aircraft industry. (Rv l'Air—Jul 1936)
 Editorial Note: The Minister of National Defence. (Rv l'Air—Aug 1936)
 Notes on the development of French military aviation. (Rv l'Air—Aug, Sep 1936)
 The air forces of our neighbors. (Rv Mil Suisse—Jul 1936)
 Lighter-than-air policy. (AN&AF Gaz—12 Nov 1936)
 The fleet air arm. (AN&AF Gaz—19 Nov 1936)
 Control of the fleet air arm. (AN&AF Gaz—10 Dec 1936)
 Air infantry. (AN&AF Gaz—17 Dec 1936)
 The influence of air power. (AN&AF Gaz—17 Dec 1936)
 Seadromes and their future. (AN&AF Gaz—14 Jan 1937)
 Aircraft versus warships: a summing up. (Jour RUSI—Nov 1936)
 Why the flight surgeon? (Mil Surg—Nov 1936)
 French Army of the air. (Res Off—Dec 1936)
 The Aircraft industry and the R.A.F. (RAF Quar—Jan 1937)
 Royal Air Force mobility—A reply. (RAF Quar—Jan 1937)

Training Tactics

Supply by airplane. (Bul Belge Mil—Aug 1936)
 Representation of fire effect and aerial observation. (Rv d'Art—Sep 1936)
 Concerning a book. (Rv l'Air—Jul 1936)
 Urban areas. (Rv l'Air—Jul 1936)
 The air-sea war in Flanders. (Rv l'Air—Jul 1936)
 Conquering the stratosphere. (Rv l'Air—Jul, Aug 1936)
 Aerial fire towards the beam in high speed airplanes. (Rv l'Air—Aug 1936)
 Employment of balloons in defense against air attack. (Rv l'Air—Aug 1936)
 Will great speeds eliminate pursuit aviation? (Rv l'Air—Sep 1936)
 Medical notes on parachute jumping. (Rv l'Air—Sep 1936)
 Bombardment at minimum altitudes. (Rv l'Air—Sep 1936)
 Staking out front lines. A problem in liaison. (Rv Mil Suisse—Jun 1936)
 Machine gun fire against airplanes. (Rv Mil Suisse—Aug 1936)
 Our recent air maneuvers. (Rv Mil Suisse—Aug 1936)
 Airplanes and espionage. (Mil Mitt—Aug 1936)

Soaring, the basic training of the aviator. (Mil-Woch—18 Sep 1936)
 Artillery and aviation. (Mil-Woch—25 Sep 1936)
 The training of parachute jumpers. (Mil-Woch—4 Oct 1936)
 Principal lessons from the Abyssinian War. [See Section 2]
 The German Army maneuvers, 1936. [See Section 2]
 The reality of airship vulnerability. (AN&AF Gaz—29 Oct 1936)
 The aircraft factor in war. (AN&AF Gaz—19 Nov 1936)
 An examination of air parity. (AN&AF Gaz—10 Dec 1936)
 Control of the fleet air arm. (AN&AF Gaz—10 Dec 1936)
 In Chesapeake Bay. (AN&AF Gaz—31 Dec 1936)
 Air power in the Pacific. (AN&AF Gaz—31 Dec 1936)
 The Douhet doctrine. (AN&AF Gaz—7 Jan 1937)
 The future of land warfare. (A Quar—Jan 1937)
 Chemicals and aircraft. (Chem War—Oct 1936)
 Co-operation. (Ftg Forc—Dec 1936)
 War in the air. (Ftg Forc—Dec 1936)
 Flying operations in Hudson Strait. (Jour RUSI—Nov 1936)
 Aircraft versus warships: a summing up. (Jour RUSI—Nov 1936)
 Air Corps schools. (Mil Eng—Jan-Feb 1937)
 The airplane in international law. (Nav Inst Proc—Nov 1936)
 Views on air defence. (RAF Quar—Jan 1937)
 Royal Air Force mobility—A reply. (RAF Quar—Jan 1937)
 Canada and war in the air. (RAF Quar—Jan 1937)

AMMUNITION

Ammunition supply in mountainous country. (Riv Art e Gen—Jul-Aug 1936)
 German small arms and ammunition. (A Ord—Jan-Feb 1937)
 The replenishment of ammunition in the light of recent developments. (RASC Quar—Nov 1936)

ANIMALS

The Horse Show of 1936. (Rv de Cav—May-Jun 1936)
 Notes relating to horses in the north countries. (Rv de Cav—May-Jun 1936)
 Horses in mountains. (Rv de Cav—Jul-Aug 1936)
 My kingdom for a horse! (Res Off—Dec 1936)

ANTI-AIRCRAFT ARTILLERY

Organization of antiaircraft artillery. (Riv Art e Gen—Jul-Aug 1936)
 The German Army maneuvers, 1936. [See Section 2]

ANTI-AIRCRAFT DEFENSE

Machine gun fire against airplanes. (Rv Mil Suisse—Aug 1936)
 Antiaircraft intelligence service in foreign countries. (Mil-Woch—11 Sep 1936)
 Antiaircraft defense of a corps. (Mil-Woch—4 Nov 1936)
 Essentials about antitank defense. [See Section 2]
 Aircraft versus warships: a summing up. (Jour RUSI—Nov 1936)
 Recent developments in visual plotting. (Roy Eng Jour—Dec 1936)
 The future of searchlights. (Roy Eng Jour—Dec 1936)

ANTI-ART

ANTITANK

- German opinions on antitank defense. (Bul Belge Mil—Aug 1936)
Tanks versus tanks. (Rv d'Inf—Aug 1936)
The tank attack under cover of natural or artificial fog. (Sanct Chris—Jul 1936)
Defense against tanks. (Sanct Chris—Jul 1936)
Defense against tank attacks made under cover of fog or smoke. (Sanct Chris—Sep 1936)
Antitank defense. (Sanct Chris—Sep 1936)
A discussion of antitank defense. (Mil-Woch—4 Sep 1936)
Tank chasers or tanks? (Mil-Woch—18 Sep 1936)
Tank chasers. (Mil-Woch—4 Oct 1936)
The importance of terrain in the defense against mechanized and horse cavalry. (Mil-Woch—25 Oct 1936)
Combat training for an antitank unit. (Mil-Woch—4 Nov 1936)
The German Army maneuvers, 1936. [See Section 2]

ARMAMENT

- Essential characteristics of tanks and their employment in battle. (Sanct Chris—Aug 1936)
Rearmament and the future. (AN&AF Gaz—26 Nov 1936)
Private manufacture of arms. (A Ord—Jan-Feb 1937)
German small arms and ammunition. (A Ord—Jan-Feb 1937)
Weapon and target. (A Quar—Jan 1937)
The search for security against war. (Jour RUSI—Nov 1936)
The American and British munitions investigations. (For Aff—Jan 1937)

ARMORED CARS

- News about motorization in foreign armies. (Sanct Chris—Jul 1936)
Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)
Military characteristics of combat vehicles. (Cav Jour—Nov-Dec 1936)

ART OF WAR STRATEGY

- Conduct of war in coalitions. (Bul Belge Mil—Aug, Sep 1936)
National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)
General Curély—cavalryman, leader, and brave soldier. (Rv de Cav—Jul-Aug 1936)
Geology in time of war. (Pion—Aug 1936)
Staking out front lines. A problem in liaison. (Rv Mil Suisse—Jun 1936)
Count Schlieffen, organizer and strategist. (Rv Mil Fran—Aug 1936)
The development of leaders in colonial wars. (Rv Mil Mitt—Aug 1936)
Tegethoff: An essay on the analysis of success. (Mil Mitt—Jul 1936)
Limanowa-Lapanow, 1914-1936. (Mil Mitt—Jul, Aug 1936)
Clausewitz' lessons on purpose and means. (Ws & Wr—Sep 1936)
Incidentals? (Mil-Woch—4 Sep 1936)
Quick action by artillery in a war of movement. (Mil-Woch—11 Sep 1936)
The problem of military training. (Mil-Woch—11 Sep 1936)
The art of war and politics in the light of military strategy prior to 1914. (Mil-Woch—11 Oct 1936)
Jena and Auerstedt in retrospect. (Mil-Woch—18 Oct 1936)

- The importance of fortifications in future war. (Mil-Woch—25 Oct 1936)
The influence of supply on strategy. [See Section 1]
A study of war plans and the realities of war. [See Section 2]
The study of military history. [See Section 2]
Principal lessons from the Abyssinian War. [See Section 2]
Preconceived ideas affecting leadership. [See Section 2]
The reasons of Italian success. [See Section 2]
Mobility and frugality. (AN&AF Gaz—12 Nov 1936)
Strategical co-ordination. (AN&AF Gaz—24 Dec 1936)
"Limited liability" war. (AN&AF Gaz—7 Jan 1937)
War's three dimensions. (AN&AF Gaz—7 Jan 1937)
Totalitarian war. (A Ord—Nov-Dec 1936)
Grand strategy of 1914-1918. (A Ord—Nov-Dec 1936)
Sheridan's cavalry at Appomattox. (A Ord—Nov-Dec 1936)
A note on British national strategy, past and future, as regards the use of land forces in time of war. (A Quar—Jan 1937)
The future of land warfare. (A Quar—Jan 1937)
Can methods of warfare be restricted? (Chem War—Oct 1936)
The development of Totalitarian Warfare. (Jour R Art—Jan 1937)
Some strategical theories of Captain Liddell Hart. (Jour RUSI—Nov 1936)
Principles of war. (QM Rev—Nov-Dec 1936)
Leadership and morale. (QM Rev—Nov-Dec 1936)
Joshua—the strategist. (Res Off—Oct 1936)
Views on air defence. (RAF Quar—Jan 1937)
Disarmament and the prevention of war. (RAF Quar—Jan 1937)
The armies of Europe. (For Aff—Jan 1937)

ARTILLERY

Organization and Equipment

- Flexible artillery action. (Bul Belge Mil—Jul 1936)
Modernization of military vehicles. (Rv d'Art—Aug 1936)
Modern artillery. (Riv Art e Gen—Jul-Aug 1936)
Some aspects of mechanization affecting the R.A. (Jour R Art—Jan 1937)

Training Tactics

- Determination of north by the polar star and a well-chosen auxiliary star. (Rv d'Art—Jul 1936)
Centralization of fire direction by polar coordinates. (Rv d'Art—Jul 1936)
Graphic fire table for Schneider 75-mm. mountain gun, model 1928. (Rv d'Art—Jul 1936)
Concerning shrapnel fire. (Rv d'Art—Aug 1936)
Site correction in the preparation of the fire of the battalion by the method of polar coordinates. (Rv d'Art—Aug 1936)
Munitions consumption in firing on a zone. (Rv d'Art—Aug 1936)
Representation of fire effect and aerial observation. (Rv d'Art—Sep 1936)
Battalion school of fire. (Rv d'Art—Sep 1936)
Mobile artillery observation posts. (Rv d'Art—Sep 1936)
Rapid calculation or determination of the prolongation of trajectories. (Rv d'Art—Sep 1936)
A method of fire preparation. (Rv d'Art—Sep 1936)
Counterbattery in a war of movement. (Riv Art e Gen—Jun 1936)

Training and employment of mountain artillery. (Riv Art e Gen—Jun 1936)
 Infantry accompanying batteries. (Riv Art e Gen—Jun 1936)
 Employment of artillery in the Somaliland plains and Abyssinian highlands. (Riv Art e Gen—Jul-Aug 1936)
 Some technical artillery data. (Rv d'Inf—Sep 1936)
 The defense of Arras by Menissier's brigade. (Rv d'Inf—Sep 1936)
 Quick action by artillery in a war of movement. (Mil-Woch—11 Sep 1936)
 Artillery and aviation. (Mil-Woch—25 Sep 1936)
 German versus French artillery control during the World War. (Mil-Woch—18 Oct 1936)
 Weapon and target. (A Quar—Jan 1937)
 One-second flights. (FA Jour—Nov-Dec 1936)
 Convoys at the crossroads. (FA Jour—Nov-Dec 1936)
 The Nineteenth goes to the campus. (FA Jour—Nov-Dec 1936)
 Dust for simulated bursts. (FA Jour—Nov-Dec 1936)
 Some aspects of mechanization affecting the R.A. (Jour R Art—Jan 1937)
 Reflections and recollections. France 1916. (Jour R Art—Jan 1937)
 My kingdom for a horse! (Res Off—Dec 1936)

ASTRONOMY

The Zeiss Planetarium. (Nav Inst Proc—Nov 1936)
 The evolution of the sextant. (Nav Inst Proc—Nov 1936)

ATTACK

The tank attack under cover of natural or artificial fog. (Sanct Chris—Jul 1936)
 Defense against tank attacks made under cover of fog or smoke. (Sanct Chris—Sep 1936)
 Surprise attack by infantry. (Mil-Woch—4 Sep 1936)

AUSTRIA (ARMY OF)

The capture of Ofen (Buda) in 1686. (Mil Mitt—Aug 1936)
 Peterwardein and Belgrade. (Ws & Wr—Jul 1936)
 The conquest of Ofens. (Ws & Wr—Sep 1936)
 The organization and equipment of the Austrian infantry. (Mil-Woch—4 Nov 1936)

AUSTRIA (NAVY OF)

Tegetthoff: An essay on the analysis of success. (Mil Mitt—Jul 1936)

B

BELGIUM (ARMY OF)

Attack on Kwaebeek trench by the 3d Infantry (Belgian), 9 September 1918. (Bul Belge Mil—Jul 1936)
 Crossing of the Meuse at Marche-les-Dames, 16 July 1935. (Bul Belge Mil—Jul 1936)
 Defense of Fort Fléron in August 1914. (Bul Belge Mil—Aug 1936)
 The 1st Grenadiers (Belgian) in the offensive of 1918. (Bul Belge Mil—Sep 1936)
 The air forces of our neighbors. (Rv Mil Suisse—Jul 1936)
 The defense of Belgium. (Mil-Woch—11 Sep 1936)
 The Belgian cavalry maneuvers in 1936. (Mil-Woch—4 Oct 1936)

BRAZIL (NAVY OF)

The Brazilian Navy in the World War. (Nav Inst Proc—Dec 1936)

BREAKTHROUGH OPERATIONS

Mountain warfare. (Bul Belge Mil—Sep 1936)
 A discussion of antitank defense. (Mil-Woch—4 Sep 1936)

BULGARIA (ARMY OF)

Bulgaria's Army of politicians. (A Quar—Jan 1937)

C

CAMOUFLAGE

The German Army maneuvers, 1936. [See Section 2]

CANADA (ARMY OF)

Notes on the training of the volunteer infantry militiamen. (Can Def Quar—Jan 1937)
 Canada and war in the air. (RAF Quar—Jan 1937)

CAVALRY

Command and Staff

General Curély—cavalryman, leader, and brave soldier. (Rv de Cav—Jul-Aug 1936)

Organization and Equipment

Thoughts on the employment of mechanized cavalry. (Rv de Cav—Jul-Aug 1936)
 The reconnaissance squadron. (Mil-Woch—18 Aug 1936)
 A command car for a cavalry regiment. (Cav Jour—Nov-Dec 1936)
 An automatic watering system. (Cav Jour—Nov-Dec 1936)
 Development of cavalry weapons, past, present, and future. (Cav Jour—Nov-Dec 1936)
 Motors in march column. (Res Off—Dec 1936)

Training Tactics

Crossing of the Meuse at Marche-les-Dames, 16 July 1935. (Bul Belge Mil—Jul 1936)
 The battle of Jaroslawice, 21 August 1914. (Rv de Cav—May-Jun 1936)
 Thoughts on the employment of mechanized cavalry. (Rv de Cav—Jul-Aug 1936)
 Horses in mountains. (Rv de Cav—Jul-Aug 1936)
 The reconnaissance squadron. (Mil-Woch—18 Aug 1936)
 The British cavalry in 1918. (Mil-Woch—18 Sep 1936)
 The Belgian cavalry maneuvers in 1936. (Mil-Woch—4 Oct 1936)
 The importance of terrain in the defense against mechanized and horse cavalry. (Mil-Woch—25 Oct 1936)
 Sheridan's cavalry at Appomattox. (A Ord—Nov-Dec 1936)
 Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)
 Cavalry, king of battle. (Res Off—Oct 1936)
 My kingdom for a horse! (Res Off—Dec 1936)
 A crossing of the Indus. (Roy Eng Jour—Dec 1936)
 Signal Communication, First Cavalry Division, maneuvers, 1936. (SC Bul—Nov-Dec 1936)

CHEMICAL SERVICE

- Two old gas helmets. (Rv d'Art—Jul 1936)
 The tank attack under cover of natural or artificial fog. (Sanct Chris—Jul 1936)
 Defense against tank attacks made under cover of fog or smoke. (Sanct Chris—Sep 1936)
 Gas respirator protection. (AN&AF Gaz—7 Jan 1937)
 Canvas model or sand table demonstration. (Can Def Quar—Jan 1937)
 Chemicals and aircraft. (Chem War—Oct 1936)
 Can methods of warfare be restricted? (Chem War—Oct 1936)
 Active duty training, 1936. (Chem War—Oct 1936)
 The gas attack at Ypres. (Chem War—Oct 1936)
 Gas in the Italo-Abyssinian campaign. (Chem War—Jan 1937)
 Chemical operations in the Second Army maneuvers. (Chem War—Jan 1937)
 First aid to gas casualties. (Chem War—Jan 1937)
 Chemical warfare organizations: France. (Chem War—Jan 1937)

CHILE (ARMY OF)

- A brief sketch of the Veterinary Service in the Chilean Army. (Vet Bul—Jan 1937)

CHINA (ARMY OF)

- Border incidents near the boundary of Manchoukuo. (Can Def Quar—Jan 1937)

CIVILIAN CONSERVATION CORPS

- Causes of death; U.S. Army compared with the C.C.C. (A Med Bul—Oct 1936)
 An outbreak of typhoid fever in a camp of the C.C.C. (Mil Surg—Nov 1936)
 Operation of Quartermaster Section, San Francisco General Depot. (QM Rev—Nov-Dec 1936)
 Military training in the C.C.C. (Res Off—Oct 1936)
 C.C.C. communication facilities at Fort Benjamin Harrison, Ind. (SC Bul—Nov-Dec 1936)

COAST ARTILLERY

- Forty years with the artillery. (CA Jour—Nov-Dec 1936)
 A circular slide rule for solving triangles. (CA Jour—Nov-Dec 1936)
 A target for axial spotting. (CA Jour—Nov-Dec 1936)
 Loading coils and repeating coils. (CA Jour—Nov-Dec 1936)
 Determination of local hour angle of a celestial body. (CA Jour—Nov-Dec 1936)
 Winter convoy. (CA Jour—Nov-Dec 1936)
 The Coast Artillery cup and the National Matches. (CA Jour—Nov-Dec 1936)

COMMAND, STAFF, AND LOGISTICS

- National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)
 Supply by airplane. (Bul Belge Mil—Aug 1936)
 General Ourély—cavalryman, leader, and brave soldier. (Rv de Cav—Jul-Aug 1936)
 The press and national defense. (Rv Mil Suisse—Jul 1936)
 The Supreme Command of the French Armies from 15 May 1917 to the Armistice. (Rv Mil Fran—Jul, Aug, Sep 1936)
 The development of leaders in colonial wars. (Rv Mil Fran—Aug 1936)

- Tegetthoff: An essay on the analysis of success. (Mil Mitt—Jul 1936)
 The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)
 Desert warfare. (Ws & Wr—Sep 1936)
 Incidental? (Mil-Woch—4 Sep 1936)
 The influence of supply on strategy. [See Section 1]
 A study of war plans and the realities of war. [See Section 2]
 The study of military history. [See Section 2]
 Principal lessons from the Abyssinian War. [See Section 2]
 Preconceived ideas affecting leadership. [See Section 2]
 Protection of the rear of the German Eighth Army during the battle of Tannenberg. [See Section 2]
 The supply of the Far Eastern Soviet Army. [See Section 2]
 A Belgian bridge-head and commerce defence. (AN&AF Gaz—3 Dec 1936)
 Military supply of large units. (A Ord—Jan-Feb 1937)
 The will of the leader. (Inf Jour—Nov-Dec 1936)
 The medical front. (Inf Jour—Nov-Dec 1936)
 Combat rations. (Inf Jour—Nov-Dec 1936)
 Training for higher command. (Jour R Art—Jan 1937)
 The need for a ministry of supply. (Jour RUSI—Nov 1936)
 The fleet flagship: A problem of naval command. (Jour RUSI—Nov 1936)
 Troop transport by motor bus. (QM Rev—Nov-Dec 1936)
 The distribution of reinforcement drivers in a major campaign. (RASC Quar—Nov 1936)
 The double echelon system of supply in 1914. (RASC Quar—Nov 1936)
 The armies of Europe. (For Aff—Jan 1937)

CONVOYS

- Winter convoy. (CA Jour—Nov-Dec 1936)
 Convoys at the crossroads. (FA Jour—Nov-Dec 1936)
 Troop transport by motor bus. (QM Rev—Nov-Dec 1936)

COUNTERATTACK

- Canvas model or sand table demonstration. (Can Def Quar—Jan 1937)

CZECHOSLOVAKIA (ARMY OF)

- Military cooperation between Czechoslovakia and Russia. (Mil-Woch—25 Sep 1936)
 Railroad connection between Soviet Russia and Czechoslovakia. (Mil-Woch—11 Oct 1936)

D

DELAYING ACTION

- Defense against tank attacks made under cover of fog or smoke. (Sanct Chris—Sep 1936)

DISARMAMENT

- Post-war political events and trends. (Can Def Quar—Jan 1937)
 Can methods of warfare be restricted? (Chem War—Oct 1936)
 The search for security against war. (Jour RUSI—Nov 1936)
 Disarmament and the prevention of war. (RAF Quar—Jan 1937)

DISCIPLINE

Marching. (Mil-Woch—11 Oct 1936)
Leadership and morale. (QM Rev—Nov-Dec 1936)

E

ECONOMICS

The strategy of raw materials. (Mil-Woch—4 Oct 1936)
Is there a form of economics pertinent to war alone? (Mil-Woch—18 Oct 1936)
Japan's trade with the Netherlands Indies. (For Aff—Jan 1937)

EGYPT (ARMY OF)

The organization of the Egyptian Army. (Bul Belge Mil—Sep 1936)

ENGINEERS

Crossing of the Meuse at Marche-les-Dame, 16 July 1935. (Bul Belge Mil—Jul 1936)
Frederick the Great as master of the art of fortification. (Pion—Aug 1936)
The Fortress of Metz. (Pion—Aug 1936)
Electrified obstacles in the World War. (Pion—Aug 1936)
The trench mortar—an engineer weapon. (Pion—Aug 1936)
Experiences of mountain warfare. (Pion—Aug 1936)
Training of engineers in the handling of motor vehicles. (Pion—Aug 1936)
Geology in time of war. (Pion—Aug 1936)
Principles of concrete construction. (Riv Art e Gen—Jun 1936)
Demolitions. (Riv Art e Gen—Jul-Aug 1936)
Principles of concrete construction in freezing weather. (Riv Art e Gen—Jul-Aug 1936)
Engineer troops. (Rv Mil Suisse—Aug 1936)
Execution of demolitions. (Rv d'Inf—Sep 1936)
Brief guide for painting work. (Rv Gen Mil—Jul-Aug, Sep-Oct 1936)
Projectiles and fortifications. (Rv Gen Mil—Jul-Aug 1936)
Study of calculations of stresses in a span of the pile bridge, heavy, type No. 1. (Rv Gen Mil—Jul-Aug 1936)
Rouget de Lisle, Officer of Engineers. (Rv Gen Mil—Sep-Oct 1936)
The award to General Faucher of the degree of Doctor "honoris causa" by the Polytechnique School of Prague. (Rv Gen Mil—Sep-Oct 1936)
Infantry and engineers versus tanks. (Mil-Woch—25 Aug 1936)
Engineers and labor battalions in the Ethiopian campaign. (Mil-Woch—4 Sep 1936)
Progress in the construction of fixed fortifications, as exemplified by Verdun and Przemyśl. (Mil-Woch—18 Sep 1936)
The Italian maneuvers in Irpinia. (Mil-Woch—25 Sep 1936)
Engineer training for infantry. (Mil-Woch—25 Sep 1936)
Experiences gained in training infantry in engineer duties. (Mil-Woch—4 Oct 1936)
The importance of fortifications in future wars. (Mil-Woch—25 Oct 1936)
The organization and equipment of engineer troops. (Mil-Woch—11 Nov 1936)
Waterway improvements in Alaska. (Mil Eng—Nov-Dec 1936)
Road construction in the combat zone. (Mil Eng—Nov-Dec 1936)
Strategic Mineral Supplies. 8. Mercury. (Mil Eng—Nov-Dec 1936)

The Fort Peck project. (Mil Eng—Nov-Dec 1936)
Building the Fort Peck dam. (Mil Eng—Nov-Dec 1936)
Engineers in Second Army maneuvers. (Mil Eng—Nov-Dec 1936)
Madden Dam, sluiceways and outlets. (Mil Eng—Nov-Dec 1936)
Summer reserve training at Fort Belvoir. (Mil Eng—Nov-Dec 1936)
Emergency machine tool procurement. (Mil Eng—Jan-Feb 1937)
Stabilizing military roads. (Mil Eng—Jan-Feb 1937)
Plane coordinate systems in regional surveys. (Mil Eng—Jan-Feb 1937)
The Fort Peck dam tunnels. (Mil Eng—Jan-Feb 1937)
Fort Peck dam spillway. (Mil Eng—Jan-Feb 1937)
Embankment of Mare Island causeway. (Mil Eng—Jan-Feb 1937)
The need for maps. (Mil Eng—Jan-Feb 1937)
Engineer requirements for the infantry division. (Mil Eng—Jan-Feb 1937)
Strategic Mineral Supplies. 9. Antimony. (Mil Eng—Jan-Feb 1937)
The survey of the Gulf of Paria. (Mil Eng—Jan-Feb 1937)
Madden Dam concrete temperatures. (Mil Eng—Jan-Feb 1937)
Lock Filling at St. Marys Fall Canal. (Mil Eng—Nov-Dec 1936)
Recent developments in visual plotting. (Roy Eng Jour—Dec 1936)
House demolitions in Palestine. (Roy Eng Jour—Dec 1936)
A crossing of the Indus. (Roy Eng Jour—Dec 1936)
The future of searchlights. (Roy Eng Jour—Dec 1936)
Mounted sappers in the Near East, 1916-19. (Roy Eng Jour—Dec 1936)
The carriage of pontoon equipment by civilian transport. (Roy Eng Jour—Dec 1936)
Engineers in armoured formations. (Roy Eng Jour—Dec 1936)
Use of dynamite in deepening a stream. (Roy Eng Jour—Dec 1936)
The Lafia-Chad route selection, 1928-1929. (Roy Eng Jour—Dec 1936)
A grid system for ordnance survey maps. (Roy Eng Jour—Dec 1936)
Travels in Tsitsihar. (Roy Eng Jour—Dec 1936)

EQUITATION

The Horse Show of 1936. (Rv de Cav—May-Jun 1936)
One-second flights. (FA Jour—Nov-Dec 1936)

EUGENE, Prince Francois of Savoy (1663-1736)

Prince Eugene: a man and an era. (Rv Mil Suisse—Jun 1936)
Peterwarden and Belgrade. (Ws & Wr—Jul 1936)
The real Prince Eugene. (Jour R Art—Jan 1937)

F

FLAGS (MILITARY-NAVAL)

Use of neutral flags in war. (AN&AF Gaz—24 Dec 1936)

FORTIFICATIONS

Defense of Fort Fléron in August 1914. (Bul Belge Mil—Aug 1936)

FR-GER

Frederick the Great as master of the art of fortification. (Pion—Aug 1936)
 The Fortress of Metz. (Pion—Aug 1936)
 Demolitions. (Riv Art e Gen—Jul-Aug 1936)
 Projectiles and fortifications. (Rv Gen Mil—Jul-Aug 1936)
 The refortification of the Dardanelles and the question of the Straits. (Mil-Woch—18 Aug 1936)
 The defense of Belgium. (Mil-Woch—11 Sep 1936)
 Progress in the construction of fixed fortifications, as exemplified by Verdun and Przemyśl. (Mil-Woch—18 Sep 1936)
 The importance of fortifications in future wars. (Mil-Woch—25 Oct 1936)
 The French Army today. (A Ord—Jan-Feb 1937)
 House demolitions in Palestine. (Roy Eng Jour—Dec 1936)

FRANCE (ARMY OF)

Auxiliary Military Forces

The reserve officer in 1936. (Rv d'Inf—Aug 1936)

Command and Staff

Editorial Note: The Minister of National Defense. (Rv l'Air—Aug 1936)
 The Supreme Command of the French Armies from 15 May 1917 to the Armistice. (Rv Mil Fran—Jul, Aug, Sep 1936)
 A study on promotion. (Rv Mil Fran—Jul 1936)

History

Two historical studies compared: "The Perfect Captain," and "The Spirit of the Knight de Folard." (Rv d'Inf—Jul 1936)

Organization and Equipment

Flexible artillery action. (Bul Belge Mil—Jul 1936)
 National defense and unified command of the army, navy and air force. (Bul Belge Mil—Aug 1936)
 Concerning a book. (Rv l'Air—Jul 1936)
 Editorial Note: The Minister of National Defense. (Rv l'Air—Aug 1936)
 Notes on the development of French military aviation. (Rv l'Air—Aug, Sep 1936)
 General Curély—cavalryman, leader, and brave soldier. (Rv de Cav—Jul-Aug 1936)
 The air forces of our neighbors. (Rv Mil Suisse—Jul 1936)
 News about motorization in foreign armies. (Sanct Chris—Jul 1936)
 Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)
 The French College of National Defense. (Mil-Woch—11 Oct 1936)
 German versus French artillery control during the World War. (Mil-Woch—18 Oct 1936)
 Germany and France—the two armies. (AN&AF Gaz—5 Nov 1936)
 The French Army today. (A Ord—Jan-Feb 1937)
 Chemical warfare organization: France. (Chem War—Jan 1937)
 French Army of the air. (Res Off—Dec 1936)
 The armies of Europe. (For Aff—Jan 1937)

Supply

The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)

Training

Fire instruction in the French infantry half a century ago. (Rv Mil Suisse—Jul 1936)

A solution to the tactical problem included in the entrance examinations of the Ecole de Guerre in 1936. (Rv d'Inf—Jul 1936)
 Battalion combats. (Rv d'Inf—Aug 1936)
 Training of noncommissioned officers. (Rv d'Inf—Aug 1936)
 The founding of the Royal Military Academy. (Rv Mil Fran—Sep 1936)
 Germany and France—the two armies. (AN&AF Gaz—5 Nov 1936)

FREDERICK II (Frederick the Great) King of Prussia (1712-1786)

Frederick the Great as master of the art of fortification. (Pion—Aug 1936)
 Frederick the Great and Winterfeldt. (Ws & Wr—Aug 1936)
 Frederick the Great as represented in the changes of military history. (Ws & Wr—Aug 1936)
 Frederick the Great and Folard. (Ws & Wr—Aug 1936)

FUTURE WARFARE

The importance of fortifications in future wars. (Mil-Woch—25 Oct 1936)
 Rearmament and the future. (AN&AF Gaz—26 Nov 1936)

G

GEOGRAPHY (MILITARY)

The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)
 Military geography and aerial warfare. (AN&AF Gaz—24 Dec 1936)
 Balkan scene. (Jour R Art—Jan 1937)
 The reasons of Italian success. [See Section 2]
 Across America by car. (Roy Eng Jour—Dec 1936)
 Travels in Tsitsihar. (Roy Eng Jour—Dec 1936)

GEOLOGY

Geology in time of war. (Pion—Aug 1936)

GERMANY (ARMY OF)

Command and Staff

The art of war and politics in the light of military strategy prior to 1914. (Mil-Woch—11 Oct 1936)
 Slav v. Teuton. (Can Def Quar—Jan 1937)

History

The history, organization, and tactics of the German Army. (Rv Mil Fran—Sep 1936)

Organization and Equipment

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)
 German opinions on antitank defense. (Bul Belge Mil—Aug 1936)
 The air forces of our neighbors. (Rv Mil Suisse—Jul 1936)
 The history, organization, and tactics of the German Army. (Rv Mil Fran—Sep 1936)
 Organic patrol units. (Mil-Woch—18 Sep 1936)
 The German army and its corps of officers in 1806 and in 1914. (Mil-Woch—11 Oct 1936)
 German versus French artillery control during the World War. (Mil-Woch—18 Oct 1936)
 The importance of terrain in the defense against mechanized and horse cavalry. (Mil-Woch—25 Oct 1936)

Shock troops. (Mil-Woch—4 Nov 1936)
 The German Army maneuvers, 1936. [See Section 2]
 Hitler and the German Army. (AN&AF Gaz—22 Oct 1936)
 Germany and France—the two armies. (AN&AF Gaz—5 Nov 1936)
 The German Army. (A Ord—Nov-Dec 1936)
 German small arms and ammunition. (A Ord—Jan-Feb 1937)
 The young German: his organizations and training. (Jour RUSI—Nov 1936)
 German colonial visions. (Res Off—Nov 1936)
 Engineers in armoured formations. (Roy Eng Jour—Dec 1936)
 The armies of Europe. (For Aff—Jan 1937)

Training

German tactical problems. (Rv d'Inf—Jul 1936)
 The history, organization, and tactics of the German Army. (Rv Mil Fran—Sep 1936)
 The problem of military training. (Mil-Woch—11 Sep 1936)
 One year military service. (Mil-Woch—11 Sep 1936)
 Organic patrol units. (Mil-Woch—18 Sep 1936)
 The delay in successive positions. (Mil-Woch—11 Oct 1936)
 Marching. (Mil-Woch—11 Oct 1936)
 Training of reserve officers. (Mil-Woch—4 Nov 1936)
 Combat training for an antitank unit. (Mil-Woch—4 Nov 1936)
 Suggestions for map maneuvers. (Mil-Woch—11 Nov 1936)
 The German Army maneuvers, 1936. [See Section 2]
 Hitler and the German Army. (AN&AF Gaz—22 Oct 1936)
 Germany and France—the two armies. (AN&AF Gaz—5 Nov 1936)
 Man-power and defence. (A Quar—Jan 1937)
 The education of the officer. (A Quar—Jan 1937)
 The young German: his organizations and training. (Jour RUSI—Nov 1936)

GREAT BRITAIN (ARMY OF)

Auxiliary Military Forces

Notes on the Territorial Army in Erehwon. (A Quar—Jan 1937)
 Service problems in Palestine. (Jour RUSI—Nov 1936)
 The Northern Brigade: King's African Rifles. (Roy Eng Jour—Dec 1936)

Command and Staff

The strategic situation of the British Empire. (Mil-Woch—11 Oct 1936)
 England and Italy in the Mediterranean. (AN&AF Gaz—26 Nov 1936)
 Rearmament and the future. (AN&AF Gaz—26 Nov 1936)
 A Belgian bridge-head and commerce defence. (AN&AF Gaz—3 Dec 1936)
 Private manufacture of arms. (A Ord—Jan-Feb 1937)
 Man-power and defence. (A Quar—Jan 1937)
 Training for higher command. (Jour R Art—Jan 1937)
 The need for a ministry of supply. (Jour RUSI—Nov 1936)

Organization and Equipment

National defense and unified command of the army, navy and air force. (Bul Belge Mil—Aug 1936)
 News about motorization in foreign armies. (Sanct Chris—Jul 1936)

Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)
 The British cavalry in 1918. (Mil-Woch—18 Sep 1936)
 The fleet air arm. (AN&AF Gaz—19 Nov 1936)
 The aircraft factor in war. (AN&AF Gaz—19 Nov 1936)
 Rearmament and the future. (AN&AF Gaz—26 Nov 1936)
 An examination of air parity. (AN&AF Gaz—10 Dec 1936)
 Control of the fleet air arm. (AN&AF Gaz—10 Dec 1936)
 Air infantry. (AN&AF Gaz—17 Dec 1936)
 Air power in the Pacific. (AN&AF Gaz—31 Dec 1936)
 Our recruiting problem and a solution. (A Quar—Jan 1937)
 The recruiting problem of the British Army. (A Quar—Jan 1937)
 Recruiting stagnation: A younger view. (A Quar—Jan 1937)
 Flying operations in Hudson Strait. (Jour RUSI—Nov 1936)
 The aircraft industry and the R.A.F. (RAF Quar—Jan 1937)
 Royal Air Force mobility—A reply. (RAF Quar—Jan 1937)
 The Kurds in Iraq. (RAF Quar—Jan 1937)
 The Royal Army Service Corps training centre and its functions. (RASC Quar—Nov 1936)
 Problems in training the divisional R.A.S.C. of the Territorial Army. (RASC Quar—Nov 1936)
 The armies of Europe. (For Aff—Jan 1937)

Personnel

Our recruiting problem and a solution. (A Quar—Jan 1937)
 The recruiting problem of the British Army. (A Quar—Jan 1937)
 Recruiting stagnation: A younger view. (A Quar—Jan 1937)

Supply

The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)

Training

Common-sense military training. (AN&AF Gaz—24 Dec 1936)
 Man-power and defence. (A Quar—Jan 1937)
 A note on British national strategy, past and future, as regards the use of land forces in time of war. (A Quar—Jan 1937)
 Canvas model or sand table demonstration. (Can Def Quar—Jan 1937)
 Co-operation. (Ftg Force—Dec 1936)
 Training for higher command. (Jour R Art—Jan 1937)
 Shooting for burials—not bull's eyes. (Jour USII—Oct 1936)
 The Royal Army Service Corps training centre and its functions. (RASC Quar—Nov 1936)
 Notes on the new 1935 F.S.R., Vols. II and III. (RASC Quar—Nov 1936)
 Problems in training the divisional R.A.S.C. of the Territorial Army. (RASC Quar—Nov 1936)

GREAT BRITAIN (NAVY OF)

"The First Line." Sea power still supreme. (AN&AF Gaz—3 Dec 1936)
 Control of the fleet air arm. (AN&AF Gaz—10 Dec 1936)
 Back to realities. (AN&AF Gaz—17 Dec 1936)
 Vulnerable naval bases. (AN&AF Gaz—14 Jan 1937)

HIST-INT

Co-operation. (Fig Forc—Dec 1936)
The fleet flagship: A problem of naval command.
(Jour RUSI—Nov 1936)
Aircraft versus warships: a summing up. (Jour
RUSI—Nov 1936)

H

HISTORY (MILITARY)

Ways and means of studying military history.
Exemplified by the skirmish at Bzowica, 10
August 1916. (Mil-Woch—4 Nov 1936)
The study of military history. [See Section 2]
The muse of history. (RAF Quar—Jan 1937)

HISTORY

Balkans

Balkan scene. (Jour R Art—Jan 1937)

China

China and the foreigner. A review of the reasons
for anti-foreign feeling. (Jour USII—Oct 1936)

Germany

Danzig and the Polish Corridor. (Mil Eng—
Nov-Dec 1936)
Germany's colonial demands. (For Aff—Jan
1937)

Great Britain

The Clash in Palestine. (Can Def Quar—Jan
1937)
The Kurds in Iraq. (RAF Quar—Jan 1937)
British experiments in state intervention. (For
Aff—Jan 1937)

Iraq

The Kurds in Iraq. (RAF Quar—Jan 1937)

Nicaragua

The Coco Patrol. Operations of a Marine patrol
along the Coco River in Nicaragua. (MC Gaz
—Nov 1936)

Palestine

The clash in Palestine. (Can Def Quar—Jan
1937)

Poland

Danzig and the Polish Corridor. (Mil Eng—
Nov-Dec 1936)

Santo Domingo

The curse of Santo Domingo. (Nav Inst Proc—
Jan 1937)

I

INFANTRY

Organization and Equipment

The fire power of the Japanese infantry division.
(Bul Belge Mil—Jul 1936)
The employment of tanks and motorcycles in
reconnaissance in Poland. (Bul Belge Mil—
Jul 1936)
Smoke-laying weapons. (Rv d'Inf—Aug 1936)
The purpose of the recent Italian maneuvers.
(Mil-Woch—11 Sep 1936)
Permanently detailed scouts in the infantry com-
pany. (Mil-Woch—18 Oct 1936)
The organization and equipment of the Austrian
infantry. (Mil-Woch—4 Nov 1936)
Motors in march column. (Res Off—Dec 1936)

Training Tactics

Attack of Kwabeek trench by the 3d Infantry
(Belgian), 9 September 1918. (Bul Belge Mil
—Jul 1936)

Infantry accompanying batteries. (Riv Art e
Gen—Jun 1936)

Staking out front lines. A problem in liaison.
(Rv Mil Suisse—Jun 1936)

Fire instruction in the French infantry half a
century ago. (Rv Mil Suisse—Jul 1936)

A solution to the tactical problem included in the
entrance examinations of the Ecole de Guerre
in 1936. (Rv d'Inf—Jul 1936)

German tactical problems. (Rv d'Inf—Jul 1936)

Battalion combats. (Rv d'Inf—Aug, Sep 1936)

Infantry and the problem of villages: I—Defense;
II—Their attack. (Rv d'Inf—Aug, Sep 1936)

Training of noncommissioned officers. (Rv d'Inf
—Aug 1936)

Tanks versus tanks. (Rv d'Inf—Aug 1936)

Execution of demolitions. (Rv d'Inf—Sep 1936)

Some technical artillery data. (Rv d'Inf—Sep
1936)

The defense of Arras by Menissier's brigade. (Rv
d'Inf—Sep 1936)

The offensive fire power of infantry. (Mil Mitt
—Aug 1936)

Defense against tanks. (Sanct Chris—Jul 1936)

Infantry and engineers versus tanks. (Mil-Woch
—25 Aug 1936)

Surprise attack by infantry. (Mil-Woch—4 Sep
1936)

Organic patrol units. (Mil-Woch—18 Sep 1936)

Engineer training for infantry. (Mil-Woch—25
Sep 1936)

Experiences gained in training infantry in engi-
neer duties. (Mil-Woch—4 Oct 1936)

The organization and equipment of engineer
troops. (Mil-Woch—11 Nov 1936)

Notes on the training of the volunteer infantry
militiamen. (Can Def Quar—Jan 1937)

Shock troops, 1938. (Inf Jour—Nov-Dec 1936)

Put a punch into night attacks. (Inf Jour—
Nov-Dec 1936)

You can't win. (Inf Jour—Nov-Dec 1936)

Someone must know. (Inf Jour—Nov-Dec 1936)

This shooting game. (Inf Jour—Nov-Dec 1936)

The national matches. (Inf Jour—Nov-Dec
1936)

Shooting for burials—not bull's eyes. (Jour
USII—Oct 1936)

Engineer requirements for the infantry division.
(Mil Eng—Jan-Feb 1937)

Weapons

The offensive fire power of infantry. (Mil Mitt
—Aug 1936)

INTELLIGENCE (MILITARY)

Airplanes and espionage. (Mil Mitt—Aug 1936)

Antiaircraft intelligence service in foreign coun-
tries. (Mil-Woch—11 Sep 1936)

American espionage during the World War. (Mil-
Woch—18 Sep 1936)

INTERNATIONAL RELATIONS

Conduct of war in coalitions. (Bul Belge Mil—
Aug, Sep 1936)

Change in American neutrality politics. (Ws &
Wr—Sep 1936)

The refortification of the Dardanelles and the
question of the Straits. (Mil-Woch—18 Aug
1936)

The situation in Tangier during the Spanish Civil
War. (Mil-Woch—25 Sep 1936)

England and Italy in the Mediterranean. (AN &
AF Gaz—26 Nov 1936)

Back to realities. (AN&AF Gaz—17 Dec 1936)

Post-war political events and trends. (Can Def
Quar—Jan 1937)

Slav v. Teuton. (Can Def Quar—Jan 1937)

"Time, space and the League." (Can Def Quar
—Jan 1937)

Can methods of warfare be restricted? (Chem War—Oct 1936)

The search for security against war. (Jour RUSI—Nov 1936)

The Spanish Civil War. (Jour RUSI—Nov 1936)

China and the foreigner. (Jour USII—Oct 1936)

The Coco Patrol. (MC Gaz—Nov 1936)

Danzig and the Polish Corridor. (Mil Eng—Nov-Dec 1936)

Submarines and the London Treaty. (Nav Inst Proc—Dec 1936)

Italy's problems and policies. (Res Off—Dec 1936)

The Kurds in Iraq. (RAF Quar—Jan 1937)

Germany's colonial demands. (For Aff—Jan 1937)

The changing balance of forces in the Pacific. (For Aff—Jan 1937)

The Spanish Rebellion and international law. (For Aff—Jan 1937)

Neutrality and peace: The view of a small power. (For Aff—Jan 1937)

British experiments in state intervention. (For Aff—Jan 1937)

Prerequisites to monetary stabilization. (For Aff—Jan 1937)

The Jews of Eastern Europe. (For Aff—Jan 1937)

How sanctions failed. (For Aff—Jan 1937)

Japan's trade with the Netherlands Indies. (For Aff—Jan 1937)

The Balearic Islands in Mediterranean strategy. (For Aff—Jan 1937)

ITALY (ARMY OF)

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)

The air forces of our neighbors. (Rv Mil Suisse—Jul 1936)

The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)

News about motorization in foreign armies. (Sanct Chris—Jul 1936)

Engineers and labor battalions in the Ethiopian campaign. (Mil-Woch—4 Sep 1936)

The purpose of the recent Italian maneuvers. (Mil-Woch—11 Sep 1936)

The Italian maneuvers in Irpinia. (Mil-Woch—25 Sep 1936)

The new Italian army of Africa. (Mil-Woch—18 Oct 1936)

The reasons of Italian success. [See Section 2]

England and Italy in the Mediterranean. (AN & AF Gaz—26 Nov 1936)

Man-power and defence. (A Quar—Jan 1937)

Italian grand maneuvers. (Res Off—Oct 1936)

Italy's problems and policies. (Res Off—Dec 1936)

The armies of Europe. (For Aff—Jan 1937)

J

JAPAN (ARMY OF)

The fire power of the Japanese infantry division. (Bul Belge Mil—Jul 1936)

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)

Modernization and motorization of the Japanese Army. (Bul Belge Mil—Sep 1936)

Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)

Border incidents near the boundary of Manchoukuo. (Can Def Quar—Jan 1937)

The changing balance of forces in the Pacific. (For Aff—Jan 1937)

Japan's trade with the Netherlands Indies. (For Aff—Jan 1937)

JOINT OPERATIONS

An introduction to the study of amphibious warfare. (MC Gaz—Nov 1936)

L

LARGE UNITS

Military supply of large units. (A Ord—Jan-Feb 1937)

Army

Protection of the rear of the German Eighth Army during the battle of Tannenberg. [See Section 2]

Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)

Corps

Antiaircraft defense of a corps. (Mil-Woch—4 Nov 1936)

Division

The fire power of the Japanese infantry division. (Bul Belge Mil—Jul 1936)

Austria: The motorized division. (Bul Belge Mil—Jul 1936)

Defense against tanks. (Sanct Chris—Jul 1936)

Organization and employment of motorized units. [See Section 2]

The German Army maneuvers, 1936. [See Section 2]

Withdrawal of the German 113th Division behind the Marne on 19-20 July 1918. [See Section 2]

The new division. (Res Off—Dec 1936)

LAW (MILITARY AND INTERNATIONAL)

Some legal aspects of the Spanish Civil War. (Mil Eng—Nov-Dec 1936)

The airplane in international law. (Nav Inst Proc—Nov 1936)

The Spanish Rebellion and international law. (For Aff—Jan 1937)

LEADERSHIP

General Curély—cavalryman, leader, and brave soldier. (Rv de Cav—Jul-Aug 1936)

Prince Eugene: a man and an era. (Rv Mil Suisse—Jun 1936)

The Supreme Command of the French Armies from 15 May 1917 to the Armistice. (Rv Mil Fran—Jul, Aug, Sep 1936)

The development of leaders in colonial wars. (Rv Mil Fran—Aug 1936)

Tegethoff: An essay on the analysis of success. (Mil Mitt—Jul 1936)

Peterwardein and Belgrade. (Ws & Wr—Jul 1936)

Quick action by artillery in a war of movement. (Mil-Woch—11 Sep 1936)

A study of war plans and the realities of war. [See Section 2]

Preconceived ideas affecting leadership. [See Section 2]

The will of the leader. (Inf Jour—Nov-Dec 1936)

The Duke of Wellington. (Inf Jour—Nov-Dec 1936)

Training for higher command. (Jour R Art—Jan 1937)

The spirit that wins. (Nav Inst Proc—Nov 1936)

Leadership and morale. (QM Rev—Nov-Dec 1936)

LEAGUE OF NATIONS

Post-war political events and trends. (Can Def Quar—Jan 1937)

"Time, space and the League." (Can Def Quar—Jan 1937)

LIAISON

- Staking out front lines. A problem in liaison. (Rv Mil Suisse—Jun 1936)
 Some technical artillery data. (Rv d'Inf—Sep 1936)
 The defense of Arras by Menissier's brigade. (Rv d'Inf—Sep 1936)
 Artillery and aviation. (Mil-Woch—25 Sep 1936)
 Engineer training for infantry. (Mil-Woch—25 Sep 1936)
 Experiences gained in training infantry in engineer duties. (Mil-Woch—4 Oct 1936)
 Co-operation. (Ftg Forc—Dec 1936)
 Engineer requirements for the infantry division. (Mil Eng—Jan-Feb 1937)

M

MACHINE GUNS

- Notes on the organization of battalion machine gun companies. (Rv Mil Suisse—Jun 1936)
 Machine gun fire against airplanes. (Rv Mil Suisse—Aug 1936)
 The reconnaissance squadron. (Mil-Woch—18 Aug 1936)
 Machine gun tactics. (Mil-Woch—25 Oct 1936)
 Weapon and target. (A Quar—Jan 1937)

MANEUVERS

- Our recent air maneuvers. (Rv Mil Suisse—Aug 1936)
 The purpose of the recent Italian maneuvers. (Mil-Woch—11 Sep 1936)
 The Italian maneuvers in Irpinia. (Mil-Woch—25 Sep 1936)
 The delay in successive positions. (Mil-Woch—11 Oct 1936)
 The German Army maneuvers, 1936. [See Section 2]
 Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)
 Chemical operations in the Second Army maneuvers. (Chem War—Jan 1937)
 Convoys at the crossroads. (FA Jour—Nov-Dec 1936)
 Contact is assimilated. (Inf Jour—Nov-Dec 1936)
 Engineers in Second Army maneuvers. (Mil Eng—Nov-Dec 1936)
 Italian grand maneuvers. (Res Off—Oct 1936)
 Signal Communication, First Cavalry Division, maneuvers, 1936. (SC Bul—Nov-Dec 1936)

MAP PROBLEMS

- German tactical problems. (Rv d'Inf—Jul 1936)
 Suggestions for map maneuvers. (Mil-Woch—11 Nov 1936)

MARCHES

- Defense against tanks. (Sanct Chris—Jul 1936)
 Marching. (Mil-Woch—11 Oct 1936)
 Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)
 Winter convoy. (CA Jour—Nov-Dec 1936)
 Motors in march column. (Res Off—Dec 1936)

MARINE CORPS

- Selection and training of recruits. (MC Gaz—Nov 1936)
 The United States Marine Corps. (MC Gaz—Nov 1936)
 The early years of the Marine Corps. (MC Gaz—Nov 1936)
 Marines in San Francisco earthquake and fire. (MC Gaz—Nov 1936)

- Marine Corps uniforms, Mexican War period. (MC Gaz—Nov 1936)
 The Coco Patrol. Operations of a Marine patrol along the Coco River in Nicaragua. (MC Gaz—Nov 1936)
 Public relations. (MC Gaz—Nov 1936)
 Seapower—What is it? Navy, Merchant Marine, Bases. (MC Gaz—Nov 1936)
 An introduction to the study of amphibious warfare. (MC Gaz—Nov 1936)

MECHANIZATION

- Will the mechanized weapon become the queen of battles? (Bul Belge Mil—Aug 1936)
 Thoughts on the employment of mechanized cavalry. (Rv de Cav—Jul-Aug 1936)
 Horses in mountains. (Rv de Cav—Jul-Aug 1936)
 Limanowa-Lapanow, 1914-1936. (Mil Mitt—Jul, Aug 1936)
 News about motorization in foreign armies. (Sanct Chris—Jul 1936)
 Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)
 The importance of terrain in the defense against mechanized and horse cavalry. (Mil-Woch—25 Oct 1936)
 Organization and employment of motorized units. [See Section 2]
 The German Army maneuvers, 1936. [See Section 2]
 The supply of the Far Eastern Soviet Army. [See Section 2]
 The reasons of Italian success. [See Section 2]
 Mobility and frugality. (AN&AF Gaz—12 Nov 1936)
 The German Army. (A Ord—Nov-Dec 1936)
 The French Army today. (A Ord—Jan-Feb 1937)
 Tanks and tactics. (A Ord—Jan-Feb 1937)
 The repairs, recovery and replenishment of mechanical vehicles in the field. (Can Def Quar—Jan 1937)
 Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)
 Military characteristics of combat vehicles. (Cav Jour—Nov-Dec 1936)
 Some aspects of mechanization affecting the R.A. (Jour R Art—Jan 1937)
 The service of the Veterinary Corps in the motorized combat armies. (Mil Surg—Dec 1936)
 My kingdom for a horse! (Res Off—Dec 1936)
 The double echelon system of supply in 1914. (RASC Quar—Nov 1936)
 The Royal Army Service Corps training centre and its functions. (RASC Quar—Nov 1936)

MEDICAL SERVICE

- Medical notes on parachute jumping. (Rv l'Air—Sep 1936)
 Causes of death: U.S. Army compared with the C.C.C. (A Med Bul—Oct 1936)
 The medical front. (Inf Jour—Nov-Dec 1936)
 The training of personnel in field ambulance duties. (Jour RAMC—Nov 1936)
 War experiences of a Territorial Medical Officer. (Jour RAMC—Nov, Dec 1936, Jan 1937)
 What medicine owes to war and war owes to medicine. (Jour RAMC—Dec 1936)
 Contribution to discussion on anxiety neurosis in the Army. (Jour RAMC—Jan 1937)
 War neurosis. (Jour RAMC—Jan 1937)
 The United States Army Medical Department 1861 to 1865. (Mil Surg—Nov 1936)
 The outbreak of typhoid fever in a camp of the C.C.C. (Mil Surg—Nov 1936)
 Mess-Economy. (Mil Surg—Nov 1936)
 Why the flight surgeon? (Mil Surg—Nov 1936)
 The surgical hospital. (Mil Surg—Nov 1936)

Dissemination of cholera by the 38th Infantry in 1867. (Mil Surg—Nov 1936)
 A method of initiating pneumothorax in the tropics. (Mil Surg—Nov 1936)
 The centenary of the Army Medical Library. (Mil Surg—Jan 1937)
 The oration commemorating the one hundredth anniversary of the founding of the Army Medical Library, Washington. (Mil Surg—Jan 1937)
 Buildings for the Army Medical Library. (Mil Surg—Jan 1937)

METEOROLOGY

Dust for simulated bursts. (FA Jour—Nov-Dec 1936)
 Some observations on the Fifth Corps Area meteorological service. (CS Bul—Nov-Dec 1936)

MOBILE WARFARE

Counterbattery in a war of movement. (Riv Art e Gen—Jun 1936)
 Quick action by artillery in a war of movement. (Mil-Woch—11 Sep 1936)
 Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)

MOBILITY

The offensive fire power of infantry. (Mil Mitt—Aug 1936)
 Essential characteristics of tanks and their employment in battle. (Sanct Chris—Aug 1936)
 The reconnaissance squadron. (Mil-Woch—18 Aug 1936)
 The influence of supply on strategy. [See Section 1]
 Organization and employment of motorized units. [See Section 2]
 Mobility and frugality. (AN&AF Gaz—12 Nov 1936)
 Military characteristics of combat vehicles. (Cav Jour—Nov-Dec 1936)
 Royal Air Force mobility—A reply. (RAF Quar—Jan 1937)

MOBILIZATION

Armies, Mobilization of

Military supply of large units. (A Ord—Jan-Feb 1937)

Industrial Mobilization

Grand strategy of 1914-1918. (A Ord—Nov-Dec 1936)
 The need for a ministry of supply. (Jour RUSI—Nov 1936)

MOLTKE, Field Marshal Helmuth Johannes Ludwig (1848-1916)

The will of the leader. (Inf Jour—Nov-Dec 1936)

MORALE

Leadership and morale. (QM Rev—Nov-Dec 1936)

MOTORIZATION

The employment of tanks and motorcycles in reconnaissance in Poland. (Bul Belge Mil—Jul 1936)
 Austria: The motorized division. (Bul Belge Mil—Jul 1936)
 Modernization and motorization of Japanese Army. (Bul Belge Mil—Sep 1936)

The motorcycle in combat. (Rv de Cav—May-Jun 1936)

Automobile chronicle. The composition of carburants (fuel). (Rv de Cav—May-Jun 1936)
 The motorcyclist tour of France. (Rv de Cav—Jul-Aug 1936)

Automobile chronicle. Gas generators for automobiles. (Rv de Cav—Jul-Aug 1936)

Training of engineers in the handling of motor vehicles. (Flon—Aug 1936)

Limanowa-Lapanow, 1914-1936. (Mil Mitt—Jul, Aug 1936)

News about motorization in foreign armies. (Sanct Chris—Jul 1936)

Essential characteristics of tanks and their employment in battle. (Sanct Chris—Aug 1936)

Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)

The reconnaissance squadron. (Mil-Woch—18 Aug 1936)

The purpose of the recent Italian maneuvers. (Mil-Woch—11 Sep 1936)

The Belgian cavalry maneuvers in 1936. (Mil-Woch—4 Oct 1936)

Principal lessons from the Abyssinian War. [See Section 2]

Organization and employment of motorized units. [See Section 2]

The supply of the Far Eastern Soviet Army. [See Section 2]

Military motor transport. (A Ord—Nov-Dec 1936)

Tanks and tactics. (A Ord—Jan-Feb 1937)

The repairs, recovery and replenishment of mechanical vehicles in the field. (Can Def Quar—Jan 1937)

Military characteristics of combat vehicles. (Cav Jour—Nov-Dec 1936)

Winter convoy. (CA Jour—Nov-Dec 1936)

Convoys at the crossroads. (FA Jour—Nov-Dec 1936)

Road reconnaissance by motor. (Mil Eng—Nov-Dec 1936)

The service of the Veterinary Corps in the motorized combat armies. (Mil Surg—Dec 1936)

Troop transport by motor bus. (QM Rev—Nov-Dec 1936)

Motors in march column. (Res Off—Dec 1936)

Engineers in armoured formations. (Roy Eng Jour—Dec 1936)

MUSIC (MILITARY-NAVAL)

Over hill, over dale, over airwave. (FA Jour—Nov-Dec 1936)

N

NATIONAL DEFENSE

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)

Editorial Note: The Minister of National Defense. (Rv l'Air—Aug 1936)

The press and national defense. (Rv Mil Suisse—Jul 1936)

The defense of Belgium. (Mil-Woch—11 Sep 1936)

The strategic situation of the British Empire. (Mil-Woch—11 Oct 1936)

The French College of National Defense. (Mil-Woch—11 Oct 1936)

A Belgian bridge-head and commerce defence. (AN&AF Gaz—3 Dec 1936)

"The First Line." Sea power still supreme. (AN&AF Gaz—3 Dec 1936)

Back to realities. (AN&AF Gaz—17 Dec 1936)

The Douhet doctrine. (AN&AF Gaz—7 Jan 1937)

NAV-QUAR

- "Limited liability" war. (AN&AF Gaz—7 Jan 1937)
Man-power and defence. (A Quar—Jan 1937)
The search for security against war. (Jour RUSI—Nov 1936)

NAVAL WARFARE

- Tegetthoff: An essay on the analysis of success. (Mil Mitt—Jul 1936)
Modern battleships. (Mil-Woch—11 Nov 1936)
Meaning of sea power. (AN&AF Gaz—26 Nov 1936)
Use of neutral flags in war. (AN&AF Gaz—24 Dec 1936)
The fleet flagship: A problem of naval command. (Jour RUSI—Nov 1936)
Aircraft versus warships: a summing up. (Jour RUSI—Nov 1936)
The neglect of sea power. (Jour RUSI—Nov 1936)
Seapower—What is it? Navy, Merchant Marine, Bases. (MC Gaz—Nov 1936)
An introduction to the study of amphibious warfare. (MC Gaz—Nov 1936)
The results of Jutland. (Nav Inst Proc—Dec 1936)
Fighting the U-Boats. (Nav Inst Proc—Dec 1936)
Submarines and the London Treaty. (Nav Inst Proc—Dec 1936)
United States submarine chasers at Gibraltar, November, 1918. (Nav Inst Proc—Dec 1936)
The Brazilian Navy in the World War. (Nav Inst Proc—Dec 1936)
Future uses of submarines. (Nav Inst Proc—Dec 1936)
The first American submarine. (Nav Inst Proc—Dec 1936)
Robert Fulton's turtle boat. (Nav Inst Proc—Dec 1936)
Excess weight in submarines. (Nav Inst Proc—Dec 1936)
The genesis of naval policies. (Nav Inst Proc—Jan 1937)
The Navy and the press during the Civil War. (Nav Inst Proc—Jan 1937)
Captain Allen's battle with the English barge. (Nav Inst Proc—Jan 1937)

NAVIGATION

- The Zeiss Planetarium. (Nav Inst Proc—Nov 1936)
The evolution of the sextant. (Nav Inst Proc—Nov 1936)

NIGHT OPERATIONS

- Put a punch into night attacks. (Inf Jour—Nov-Dec 1936)

NORWAY (ARMY OF)

- The Norwegian Army. (Bul Belge Mil—Jul 1936)
A great ship's last mooring. (Nav Inst Proc—Jan 1937)

NORWAY (NAVY OF)

- The Norwegian Army. (Bul Belge Mil—Jul 1936)

O

OBSTACLES

- Electrified obstacles in the World War. (Pion—Aug 1936)
Defense against tank attacks made under cover of fog or smoke. (Sanct Chris—Sep 1936)

- Antitank defense. (Sanct Chris—Sep 1936)
Infantry and engineers versus tanks. (Mil-Woch—25 Aug 1936)

ORDNANCE

- What price automatic? (A Ord—Nov-Dec 1936)
Army Ordnance Service. (A Ord—Nov-Dec 1936, Jan-Feb 1937)
Tanks and tactics. (A Ord—Jan-Feb 1937)
The American and British munitions investigations. (For Aff—Jan 1937)

OVERSEAS EXPEDITIONS

- An introduction to the study of amphibious warfare. (MC Gaz—Nov 1936)

P

- PETAÏN, Marshal Henri Philippe Benoni Omer Joseph (1856—)

- The Supreme Command of the French Armies from 15 May 1917 to the Armistice. (Rv Mil Fran—Jul, Aug, Sep 1936)

PHOTOGRAPHY

Aerial Photography

- Modern cartographers take to the air. (QM Rev—Nov-Dec 1936)

POLAND (ARMY OF)

- The employment of tanks and motorcycles in reconnaissance in Poland. (Bul Belge Mil—Jul 1936)
National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)
Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)

PORTUGAL (ARMY OF)

- The future of Portugal's colonies. (For Aff—Jan 1937)

PRINCIPLES OF WAR

- Principles of war. (QM Rev—Nov-Dec 1936)

PROMOTION

- A study on promotion. (Rv Mil Fran—Jul 1936)

Q

QUARTERMASTER SERVICE

- Military motor transport. (A Ord—Nov-Dec 1936)
The repairs, recovery and replenishment of mechanical vehicles in the field. (Can Def Quar—Jan 1937)
Operation of Quartermaster Section, San Francisco General Depot. (QM Rev—Nov-Dec 1936)
Troop transport by motor bus. (QM Rev—Nov-Dec 1936)
The Army comes clean. (QM Rev—Nov-Dec 1936)
Know the answers! (QM Rev—Nov-Dec 1936)
Guide for sales officers, U.S. Army. (QM Rev—Nov-Dec 1936)
The Quartermaster Storehouse of Knowledge. Problem No. VI. (QM Rev—Nov-Dec 1936)
The distribution of reinforcement drivers in a major campaign. (RASC Quar—Nov 1936)
The double echelon system of supply in 1914. (RASC Quar—Nov 1936)

The replenishment of ammunition in the light of recent developments. (RASC Quar—Nov 1936)
 The Royal Army Service Corps training centre and its functions. (RASC Quar—Nov 1936)
 Notes on the new 1935 F.S.R., Vols. II and III. (RASC Quar—Nov 1936)
 Problems in training the divisional R.A.S.C. of the Territorial Army. (RASC Quar—Nov 1936)
 The carriage of baggage on active service. (RASC Quar—Nov 1936)

R

RECONNAISSANCE

The employment of tanks and motorcycles in reconnaissance in Poland. (Bul Belge Mil—Jul 1936)
 The reconnaissance squadron. (Mil-Woch—18 Aug 1936)
 The British cavalry in 1918. (Mil-Woch—18 Sep 1936)
 Organic patrol units. (Mil-Woch—18 Sep 1936)
 Road reconnaissance by motor. (Mil Eng—Nov-Dec 1936)

RIOTS

Military control of a disturbed area. (Jour RUSI—Nov 1936)

RIVER CROSSINGS

Crossing of the Meuse at Marche-les-Dames, 16 July 1935. (Bul Belge Mil—Jul 1936)
 Engineer requirements for the infantry division. (Mil Eng—Jan-Feb 1937)
 A crossing of the Indus. (Roy Eng Jour—Dec 1936)

ROUTES COMMUNICATIONS

The influence of supply on strategy. [See Section 1]

Bridges Bridging

Study of calculations of stresses in a span of the pile bridge, heavy, type No. 1. (Rv Gen Mil—Jul-Aug 1936)

Highways Military Roads

Engineers and labor battalions in the Ethiopian campaign. (Mil-Woch—4 Sep 1936)
 Military cooperation between Czechoslovakia and Russia. (Mil-Woch—25 Sep 1936)
 Railroad connection between Soviet Russia and Czechoslovakia. (Mil-Woch—11 Oct 1936)
 Principal lessons from the Abyssinian War. [See Section 2]
 The reasons of Italian success. [See Section 2]
 The highway of war. (AN&AF Gaz—22 Oct 1936)
 Road construction in the combat zone. (Mil Eng—Nov-Dec 1936)
 Stabilizing military roads. (Mil Eng—Jan-Feb 1937)
 Roads and roads and roads. (Res Off—Dec 1936)

RUSSIA (ARMY OF)

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)
 Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)
 Military cooperation between Czechoslovakia and Russia. (Mil-Woch—25 Sep 1936)
 The training of parachute jumpers. (Mil-Woch—4 Oct 1936)

Railroad connection between Soviet Russia and Czechoslovakia. (Mil-Woch—11 Oct 1936)
 The supply of the Far Eastern Soviet Army. [See Section 2]
 Slav v. Teuton. (Can Def Quar—Jan 1937)
 The armies of Europe. (For Aff—Jan 1937)

S

v.SCHLIEFFEN, Field Marshal Alfred (1833-1913)

Count Schlieffen, organizer and strategist. (Rv Mil Fran—Aug 1936)

SEAPOWER

Meaning of sea power. (AN&AF Gaz—26 Nov 1936)
 "The First Line." Sea power still supreme. (AN&AF Gaz—3 Dec 1936)
 The neglect of sea power. (Jour RUSI—Nov 1936)
 Seapower—What is it? Navy, Merchant Marine, Bases. (MC Gaz—Nov 1936)
 The genesis of naval policies. (Nav Inst Proc—Jan 1937)

SIGNAL SERVICE

Radio work in campaign. (Riv Art e Gen—Jun 1936)
 Views on the value, duration and execution of telegraph exercises on a large scale. (Mil Mitt—Sep 1936)
 Has the Army too much radio? (Inf Jour—Nov-Dec 1936)
 Home of the Signal Corps. (QM Rev—Nov-Dec 1936)
 Post Signal activities at Wright Field and Patterson Field. (SC Bul—Nov-Dec 1936)
 Signal Corps R.O.T.C. in the Fifth Corps Area. (SC Bul—Nov-Dec 1936)
 C.C.C. communication facilities at Fort Benjamin Harrison, Ind. (SC Bul—Nov-Dec 1936)
 Signal Corps training in the C.M.T.C., Fort Benjamin Harrison, Ind. (SC Bul—Nov-Dec 1936)
 Advanced training for Signal Corps officers of the Regular Army at Ohio State University. (SC Bul—Nov-Dec 1936)
 Some observations on the Fifth Corps Area meteorological service. (SC Bul—Nov-Dec 1936)
 The Army amateur radio system, Fifth Corps Area. (SC Bul—Nov-Dec 1936)
 Train dispatching. (SC Bul—Nov-Dec 1936)
 Signal Communication, First Cavalry Division, maneuvers, 1936. (SC Bul—Nov-Dec 1936)
 Radio reception. (SC Bul—Nov-Dec 1936)
 Solution of a Playfair cipher. (SC Bul—Nov-Dec 1936)

SUBMARINES

Fighting the U-Boats. (Nav Inst Proc—Dec 1936)
 Submarines and the London Treaty. (Nav Inst Proc—Dec 1936)
 United States submarine chasers at Gibraltar, November, 1918. (Nav Inst Proc—Dec 1936)
 Future uses of submarines. (Nav Inst Proc—Dec 1936)
 The first American submarine. (Nav Inst Proc—Dec 1936)
 Robert Fulton's turtle boat. (Nav Inst Proc—Dec 1936)
 Excess weight in submarines. (Nav Inst Proc—Dec 1936)

SUP-TANK

SUPPLY

Supply by airplane. (Bul Belge Mil—Aug 1936)
Automobile chronicle. The composition of car-
burants (fuel). (Rv de Cav—May-Jun 1936)
Automobile chronicle. Gas generators for auto-
mobiles. (Rv de Cav—Jul-Aug 1936)
Ammunition supply in mountainous country.
(Riv Art e Gen—Jul-Aug 1936)
The geographic potentialities in oil supply of the
sea powers: England, France and Italy. (Ws
& Wr—Jul 1936)
Desert warfare. (Ws & Wr—Sep 1936)
Is there a form of economics pertinent to war
alone? (Mil-Woch—18 Oct 1936)
The problem of food supply for England during
the World War. (Mil-Woch—25 Oct 1936)
The influence of supply on strategy. [See Sec-
tion 1]
Principal lessons from the Abyssinian War. [See
Section 2]
The supply of the Far Eastern Soviet Army. [See
Section 2]
Food supplies in time of war. (AN&AF Gaz—
29 Oct 1936)
Mobility and frugality. (AN&AF Gaz—12 Nov
1936)
A Belgian bridge-head and commerce defence.
(AN&AF Gaz—3 Dec 1936)
Military supply of large units. (A Ord—Jan-Feb
1937)
Combat rations. (Inf Jour—Nov-Dec 1936)
The need for a ministry of supply. (Jour RUSI
—Nov 1936)
Strategic Mineral Supplies. 8. Mercury. (Mil
Eng—Nov-Dec 1936)
Emergency machine tool procurement. (Mil Eng
—Jan-Feb 1937)
Strategic Mineral Supplies. 9. Antimony. (Mil
Eng—Jan-Feb 1937)
Mess-economy. (Mil Surg—Nov 1936)
The aircraft industry and the R.A.F. (RAF Quar
—Jan 1937)
The double echelon system of supply in 1914.
(RASC Quar—Nov 1936)
The replenishment of ammunition in the light
of recent developments. (RASC Quar—Nov
1936)

SURPRISE

Surprise attack by infantry. (Mil-Woch—4 Sep
1936)

SWEDEN (ARMY OF)

News about motorization in foreign armies.
(Sanct Chris—Jul 1936)

SWITZERLAND (ARMY OF)

Notes on the organization of battalion machine
gun companies. (Rv Mil Suisse—Jun 1936)
Engineer troops. (Rv Mil Suisse—Aug 1936)
Our recent air maneuvers. (Rv Mil Suisse—Aug
1936)

T

TACTICS OPERATIONS

Defensive Combat

Infantry and the problem of villages: I—Defense;
II—Their attack. (Rv d'Inf—Aug, Sep 1936)
Defense against tanks. (Sanct Chris—Jul 1936)
Defense against tank attacks made under cover
of fog or smoke. (Sanct Chris—Sep 1936)
Antitank defense. (Sanct Chris—Sep 1936)
A discussion of antitank defense. (Mil-Woch—4
Sep 1936)
Withdrawal of the German 113th Division behind
the Marne on 19-20 July 1918. [See Section 2]

Canvas model or sand table demonstration. (Can
Def Quar—Jan 1937)
Views on air defence. (RAF Quar—Jan 1937)

Offensive Combat

Infantry and the problem of villages: I—Defense;
II—Their attack. (Rv d'Inf—Aug, Sep 1936)
The tank attack under cover of natural or arti-
ficial fog. (Sanct Chris—Jul 1936)
Was the offensive against Verdun in 1916 the
only possible solution? (Mil-Woch—18 Aug
1936)
Surprise attack by infantry. (Mil-Woch—4 Sep
1936)
Views on air defence. (RAF Quar—Jan 1937)

Special Warfare

Mountain warfare. (Bul Belge Mil—Sep 1936)
Horses in mountains. (Rv de Cav—Jul-Aug
1936)
Experiences of mountain warfare. (Pion—Aug
1936)
Infantry and the problem of villages: I—Defense;
II—Their attack. (Rv d'Inf—Aug, Sep 1936)
The development of leaders in colonial wars.
(Rv Mil Fran—Aug 1936)
Desert warfare. (Ws & Wr—Sep 1936)
Mountain troops. (Mil-Woch—11 Oct 1936)
Military control of a disturbed area. (Jour RUSI
—Nov 1936)

Troop Movements

Principal lessons from the Abyssinian War. [See
Section 2]
Troop transport by motor bus. (QM Rev—Nov-
Dec 1936)

TANKS

The employment of tanks and motorcycles in
reconnaissance in Poland. (Bul Belge Mil—
Jul 1936)
Will the mechanized weapon become the queen
of battles? (Bul Belge Mil—Aug 1936)
The creator of tanks. (Rv d'Art—Jul 1936)
Compared effectiveness of French and English
tanks during the War of 1914-1918. (Rv d'Inf
—Jul 1936)
Tanks versus tanks. (Rv d'Inf—Aug 1936)
The classification of tanks. (Rv Mil Fran—Jul
1936)
The tank attack under cover of natural or arti-
ficial fog. (Sanct Chris—Jul 1936)
Defense against tanks. (Sanct Chris—Jul 1936)
News about motorization in foreign armies.
(Sanct Chris—Jul 1936)
Tank chasers or tanks? (Mil-Woch—18 Sep
1936)
Essential characteristics of tanks and their em-
ployment in battle. (Sanct Chris—Aug 1936)
Latest equipment of mechanized and motorized
units. (Sanct Chris—Sep 1936)
Defense against tank attacks made under cover
of fog or smoke. (Sanct Chris—Sep 1936)
Antitank defense. (Sanct Chris—Sep 1936)
The reconnaissance squadron. (Mil-Woch—18
Aug 1936)
Infantry and engineers versus tanks. (Mil-Woch
—25 Aug 1936)
A discussion of antitank defense. (Mil-Woch—4
Sep 1936)
Tank chasers. (Mil-Woch—4 Oct 1936)
The importance of terrain in the defense against
mechanized and horse cavalry. (Mil-Woch—
25 Oct 1936)
Combat training for an antitank unit. (Mil-
Woch—4 Nov 1936)
Tank construction in the United States. (Mil-
Woch—11 Nov 1936)

Organization and employment of motorized units. [See Section 2]

The German Army maneuvers, 1936. [See Section 2]

Essentials about antitank defense. [See Section 2]

The supply of the Far Eastern Soviet Army. [See Section 2]

Tanks and tactics. (A Ord—Jan-Feb 1937)

The future of land warfare. (A Quar—Jan 1937)

Weapon and target. (A Quar—Jan 1937)

Tanks in the Chaco War. (A Quar—Jan 1937)

Military characteristics of combat vehicles. (Cav Jour—Nov-Dec 1936)

Shock troops, 1938. (Inf Jour—Nov-Dec 1936)

Tanks in India. (Res Off—Nov 1936)

When tank meets tank. (Res Off—Nov 1936)

TERRAIN

The importance of terrain in the defense against mechanized and horse cavalry. (Mil-Woch—25 Oct 1936)

TOPOGRAPHY SURVEYING

Plane coordinate systems in regional surveys. (Mil Eng—Jan-Feb 1937)

The survey of the Gulf of Persia. (Mil Eng—Jan-Feb 1937)

Maps Mapping

The need for maps. (Mil Eng—Jan-Feb 1937)

The Lafia-Chad route selection, 1928-1929. (Roy Eng Jour—Dec 1936)

A grid system for ordnance survey maps. (Roy Eng Jour—Dec 1936)

TRANSPORTATION

The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)

Military motor transport. (A Ord—Nov-Dec 1936)

Winter convoy. (CA Jour—Nov-Dec 1936)

Convoys at the crossroads. (FA Jour—Nov-Dec 1936)

Troop transport by motor bus. (QM Rev—Nov-Dec 1936)

The distribution of reinforcement drivers in a major campaign. (RASC Quar—Nov 1936)

The Royal Army Service Corps training centre and its functions. (RASC Quar—Nov 1936)

The carriage of pontoon equipment by civilian transport. (Roy Eng Jour—Dec 1936)

U

UNITED STATES (ARMY OF)

Auxiliary Military Forces

The Nineteenth goes to the campus. (FA Jour—Nov-Dec 1936)

What of the R.O.T.C.? (Inf Jour—Nov-Dec 1936)

Command and Staff

Military effectiveness. (Nav Inst Proc—Nov 1936)

Forts and Military Establishments

Home of the Signal Corps. (QM Rev—Nov-Dec 1936)

The Fifth Corps Area. (SC Bul—Nov-Dec 1936)

History

The thirty years' peace. An interlude in the history of the United States Army. (A Ord—Jan-Feb 1937)

The Legion of the Lost. (CA Jour—Nov-Dec 1936)

Organization and Equipment

National defense and unified command of the army, navy, and air force. (Bul Belge Mil—Aug 1936)

Tank construction in the United States. (Mil-Woch—11 Nov 1936)

Lighter-than-air policy. (AN&AF Gaz—12 Nov 1936)

The thirty years' peace. An interlude in the history of the United States Army. (A Ord—Jan-Feb 1937)

Has the Army too much radio? (Inf Jour—Nov-Dec 1936)

The Army comes clean. (QM Rev—Nov-Dec 1936)

Personnel

Military effectiveness. (Nav Inst Proc—Nov 1936)

Training

Mechanized cavalry in the Second Army Maneuvers, 1936. (Cav Jour—Nov-Dec 1936)

Active duty training, 1936. (Chem War—Oct 1936)

Chemical operations in the Second Army maneuvers. (Chem War—Jan 1937)

Winter convoy. (CA Jour—Nov-Dec 1936)

Contact is assimilated. (Inf Jour—Nov-Dec 1936)

The Legion of the Lost. (Inf Jour—Nov-Dec 1936)

Twenty Jominis are wrong. (Inf Jour—Nov-Dec 1936)

The national matches. (Inf Jour—Nov-Dec 1936)

Engineers in Second Army maneuvers. (Mil Eng—Nov-Dec 1936)

Summer reserve training at Fort Belvoir. (Mil Eng—Nov-Dec 1936)

Signal Communication, First Cavalry Division, maneuvers, 1936. (SC Bul—Nov-Dec 1936)

UNITED STATES (NAVY OF)

Auxiliary Naval Forces

The story of the Coast Guard. (Mil Eng—Jan-Feb 1937)

Command and Staff

The spirit that wins. (Nav Inst Proc—Nov 1936)

Finance

Paying combatants in foreign wars. (Nav Inst Proc—Jan 1937)

Prerequisites to monetary stabilization. (For Aff—Jan 1937)

History

Origin of the United States Navy. (Nav Inst Proc—Nov 1936)

Organization and Equipment

Wartime ships of stone. (Mil Eng—Nov-Dec 1936)

Legal bases for the use of foreign armed forces in China. (Nav Inst Proc—Nov 1936)

Origin of the United States Navy. (Nav Inst Proc—Nov 1936)

The first American submarine. (Nav Inst Proc—Dec 1936)

Robert Fulton's turtle boat. (Nav Inst Proc—Dec 1936)

The new division. (Res Off—Dec 1936)

VE-WARS

Training

Creep, or latitude error, in torpedo fire. (Nav Inst Proc—Nov 1936)
Intership communication—its importance in war and peace. (Nav Inst Proc—Nov 1936)
The Navy and the press during the Civil War. (Nav Inst Proc—Jan 1937)

V

VEHICLES

Modernization of military vehicles. (Rv d'Art—Aug 1936)

VENEZUELA (ARMY OF)

Latest equipment of mechanized and motorized units. (Sanct Chris—Sep 1936)

VETERINARY SERVICE

The service of the Veterinary Corps in the motorized combat armies. (Mil Surg—Nov 1936)
Equine Encephalomyelitis in Panama. (Vet Bul—Jan 1937)
A brief sketch of the Veterinary Service in the Chilean Army. (Vet Bul—Jan 1937)
Poisonous plants of Hawaii. (Vet Bul—Jan 1937)
Skeletal disease of the horse. (Vet Bul—Jan 1937)

W

WAR PEACE

The cost of warfare in former times and at present. (Mil Mitt—Sep 1936)
The geographic potentialities in oil supply of the sea powers: England, France and Italy. (Ws & Wr—Jul 1936)
War economics as a science. (Mil-Woch—18 Sep 1936)
The strategy of raw materials. (Mil-Woch—4 Oct 1936)
Is there a form of economics pertinent to war alone? (Mil-Woch—18 Oct 1936)
Food supplies in time of war. (AN&AF Gaz—29 Oct 1936)
Rearmament and the future. (AN&AF Gaz—26 Nov 1936)
Back to realities. (AN&AF Gaz—17 Dec 1936)
"Limited liability" war. (AN&AF Gaz—7 Jan 1936)
Totalitarian war. (A Ord—Nov-Dec 1936)
Grand strategy of 1914-1918. (A Ord—Nov-Dec 1936)
Military supply of large units. (A Ord—Jan-Feb 1937)
The thirty years' peace. An interlude in the history of the United States Army. (A Ord—Jan-Feb 1937)
Post-war political events and trends. (Can Def Quar—Jan 1937)
The development of Totalitarian Warfare. (Jour R Art—Jan 1937)
The search for security against war. (Jour RUSI—Nov 1936)
Mess-economy. (Mil-Surg—Nov 1936)
The spirit that wins. (Nav Inst Proc—Nov 1936)
Disarmament and the prevention of war. (RAF Quar—Jan 1937)
Neutrality and peace: The view of a small power. (For Aff—Jan 1937)
Wars within wars. (For Aff—Jan 1937)
How sanctions failed. (For Aff—Jan 1937)

WARS

AFRICA

ITALY-ABYSSINIA (1935-1936)

Employment of artillery in the Somaliland plains and Abyssinian highlands. (Riv Art e Gen—Jul-Aug 1936)
Engineers and labor battalions in the Ethiopian campaign. (Mil-Woch—4 Sep 1936)
Principal lessons from the Abyssinian War. [See Section 2]
The reasons of Italian success. [See Section 2]
Gas in the Italo-Abyssinian campaign. (Chem War—Jan 1937)

ASIA

INDIA

Sikh Wars (1845-1849)

The night of Ferozeshah, 21st-22nd of December, 1845. (A Quar—Jan 1937)

JAPAN-RUSSIA (1904-1905)

The Battle of Telisau. (Ftg Fore—Dec 1936)

EUROPE

17th CENTURY

The capture of Ofen (Buda) in 1686. (Mil Mitt—Aug 1936)
The conquest of Ofens (1686). (Ws & Wr—Sep 1936)

18th CENTURY

War of Spanish Succession (1702-1714)

Prince Eugene: a man and an era. (Rv Mil Suisse—Jun 1936)
Peterwardein and Belgrade. (Ws & Wr—Jul 1936)
The unfought Waterloo. (Ftg Fore—Dec 1936)
The real Prince Eugene. (Jour R Art—Jan 1937)

Seven Years' War (1756-1763)

Frederick the Great and Winterfeldt. (Ws & Wr—Aug 1936)
Frederick the Great as represented in the changes of military history. (Ws & Wr—Aug 1936)
Frederick the Great and Poland. (Ws & Wr—Aug 1936)

NAPOLEONIC WARS (1795-1815)

Jena and Auerstedt in retrospect. (Mil-Woch—18 Oct 1936)
The influence of supply on strategy. [See Section 1]
The Duke of Wellington. (Inf Jour—Nov-Dec 1936)

SPANISH CIVIL WAR (1936-1937)

The situation in Tangier during the Spanish Civil War. (Mil-Woch—25 Sep 1936)
The Spanish Civil War. (Jour RUSI—Nov 1936)
Some legal aspects of the Spanish Civil War. (Mil Eng—Nov-Dec 1936)
The Spanish Rebellion and international law. (For Aff—Jan 1937)

SOUTH AMERICA

CHACO WAR (1932-1935)

Tanks in the Chaco War. (A Quar—Jan 1937)

UNITED STATES

INDIAN CAMPAIGNS

Later 19th Century (1865-1901)

The thirty years' peace. An interlude in the history of the United States Army. (A Ord—Jan-Feb 1937)

REVOLUTION (1775-1783)

The influence of supply on strategy. [See Section 1]

WAR OF 1812 (1812-1814)

Captain Allen's battle with the English barge. (Nav Inst Proc—Jan 1937)

CIVIL WAR (1861-1865)

The influence of supply on strategy. [See Section 1]
Sheridan's cavalry at Appomattox. (A Ord—Nov-Dec 1936)
The United States Army Medical Department 1861 to 1865. (Mil Surg—Nov 1936)
The Navy and the press during the Civil War. (Nav Inst Proc—Jan 1937)

PHILIPPINE INSURRECTION (1899-1902)

Fitum. (Inf Jour—Nov-Dec 1936)

WORLD WAR (1914-1918)

E—General Military History

Was the offensive against Verdun in 1916 the only possible solution? (Mil-Woch—18 Aug 1936)
Verdun in military literature. (Mil-Woch—4 Sep 1936)
War diaries and official history. (Mil-Woch—25 Oct 1936)
Ways and means of studying military history. Exemplified by the skirmish at Bzowica, 10 August 1916. (Mil-Woch—4 Nov 1936)
The vindication of General Gough. (AN&AF Gaz—19 Nov 1936)
The World War in history. (A Ord—Nov-Dec 1936)
Lloyd George among the generals. (Ftg Fore—Dec 1936)
Charting America's news of the World War. (For Aff—Jan 1937)

G—Arms and Services

AIR ARM

The air-sea war in Flanders. (Rv l'Air—Jul 1936)
Employment of balloons in defense against air attack. (Rv l'Air—Aug 1936)

ARTILLERY

German versus French artillery control during the World War. (Mil-Woch—18 Oct 1936)
Reflections and recollections. France 1916. (Jour R Art—Jan 1937)

CAVALRY

The battle of Jaroslawice, 21 August 1914. (Rv de Cav—May-Jun 1936)
The British cavalry in 1918. (Mil-Woch—18 Sep 1936)

CHEMICAL SERVICE

The gas attack at Ypres. (Chem War—Oct 1936)

ENGINEERS

Electrified obstacles in the World War. (Pion—Aug 1936)
Execution of demolitions. (Rv d'Inf—Sep 1936)
Progress in the construction of fixed fortifications, as exemplified by Verdun and Przemyśl. (Mil-Woch—18 Sep 1936)
Mounted sappers in the Near East, 1916-19. (Roy Eng Jour—Dec 1936)

INFANTRY

Attack of Kwaebeek trench by the 3d Infantry (Belgian), 9 September 1918. (Bul Belge Mil—Jul 1936)
Battalion combats. (Rv d'Inf—Aug, Sep 1936)
Execution of demolitions. (Rv d'Inf—Sep 1936)
The defense of Arras by Menissier's brigade. (Rv d'Inf—Sep 1936)
Machine gun tactics. (Mil-Woch—25 Oct 1936)

MACHINE GUNS

Machine gun tactics. (Mil-Woch—25 Oct 1936)

MEDICAL SERVICE

Mess-economy. (Mil Surg—Nov 1936)

TANKS

Compared effectiveness of French and English tanks during the War of 1914-1918. (Rv d'Inf—Jul 1936)
Tanks versus tanks. (Rv d'Inf—Aug 1936)

H—Military Conduct of the War in the Field

The Supreme Command of the French Armies from 15 May 1917 to the Armistice. (Rv Mil Fran—Jul, Aug, Sep 1936)
Was the offensive against Verdun in 1916 the only possible solution? (Mil-Woch—18 Aug 1936)
Verdun in military literature. (Mil-Woch—4 Sep 1936)
American espionage during the World War. (Mil-Woch—18 Sep 1936)
German versus French artillery control during the World War. (Mil-Woch—18 Oct 1936)
The problem of food supply for England during the World War. (Mil-Woch—25 Oct 1936)
The influence of supply on strategy. [See Section 1]
A study of war plans and the realities of war. [See Section 2]
Preconceived ideas affecting leadership. [See Section 2]
Withdrawal of the German 113th Division behind the Marne on 19-20 July 1918. [See Section 2]
Protection of the rear of the German Eighth Army during the Battle of Tannenberg. [See Section 2]
Grand strategy of 1914-1918. (A Ord—Nov-Dec 1936)
Mesopotamia. (A Quar—Jan 1937)
The will of the leader. (Inf Jour—Nov-Dec 1936)
Two further lectures on the Mesopotamia Campaign—4th October 1915 to 11th March 1917. (Jour USII—Oct 1936)

WARS-WW-J-L-WITH

The double echelon system of supply in 1914.
(RASC Quar—Nov 1936)

J—Campaigns and Battles

AFRICAN THEATER

German East Africa

Military operations in Belgian East Africa, 1914-1918. (Bul Belge Mil—Jul, Aug, Sep 1936)

ASIATIC AREA—TURKISH THEATER

Mesopotamian Front

Mesopotamia. (A Quar—Jan 1937)

Two further lectures on the Mesopotamia Campaign—4th October 1915 to 11th March 1917. (Jour USII—Oct 1936)

Palestine Front

Desert warfare. (Ws & Wr—Sep 1936)

EUROPEAN AREA—BALKAN THEATER

Bulgarian Front

The French plan of operations in the Balkans in the autumn of 1918. (Mil Mitt—Sep 1936)

Grecian Front

Mounted sappers in the Near East, 1916-19. (Roy Eng Jour—Dec 1936)

Serbian Front

Twenty years ago: The war against Serbia, 1914-1915. (Mil Mitt—Sep 1936)

EUROPEAN AREA—RUSSIAN THEATER

The battle of Jaroslawice, 21 August 1914. (Rv de Cav—May-Jun 1936)

Limanowa-Lapanow, 1914-1936. (Mil Mitt—Jul, Aug 1936)

Ways and means of studying military history. Exemplified by the skirmish at Bzowica, 10 August 1916. (Mil-Woch—4 Nov 1936)

Protection of the rear of the German Eighth Army during the Battle of Tannenberg. [See Section 2]

EUROPEAN AREA—WESTERN THEATER

1914

Defense of Fort Fléron in August 1914. (Bul Belge Mil—Aug 1936)

The 1st Grenadiers (Belgian) in the offensive of 1918. (Bul Belge Mil—Sep 1936)

Bertencourt, 30 August 1914. (Rv d'Inf—Jul 1936)

Battalion combats. (Rv d'Inf—Aug, Sep 1936)

Execution of demolitions. (Rv d'Inf—Sep 1936)

The defense of Arras by Menissier's brigade. (Rv d'Inf—Sep 1936)

The will of the leader. (Inf Jour—Nov-Dec 1936)

1915

The gas attack at Ypres. (Chem War—Oct 1936)

1916

Was the offensive against Verdun in 1916 the only possible solution? (Mil-Woch—18 Aug 1936)

Verdun in military literature. (Mil-Woch—4 Aug 1936)

Preconceived ideas affecting leadership. [See Section 2]

Reflections and recollections. France 1916 (Jour R Art—Jan 1937)

1918

Attack of Kwaebeek trench by the 3d Infantry (Belgian), 9 September 1918. (Bul Belge Mil—Jul 1936)

Tanks versus tanks. (Rv d'Inf—Aug 1936)

Withdrawal of the German 113th Division behind the Marne on 19-20 July 1918. [See Section 2]

A German general on the March, 1918, offensive (A Quar—Jan 1937)

L—Naval History

The air-sea war in Flanders. (Rv l'Air—Jul 1936)

An introduction to the study of amphibious warfare. (MC Gaz—Nov 1936)

The results of Jutland. (Nav Inst Proc—Dec 1936)

Fighting the U-Boats. (Nav Inst Proc—Dec 1936)

United States submarine chasers at Gibraltar, November, 1918. (Nav Inst Proc—Dec 1936)

The Brazilian Navy in the World War. (Nav Inst Proc—Dec 1936)

WEAPONS

Modern minenwerfers. (Bul Belge Mil—Sep 1936)

The trench mortar—an engineer weapon. (Rv d'Inf—Aug 1936)

Smoke-laying weapons. (Rv d'Inf—Aug 1936)

New weapons. (Mil Mitt—Jul 1936)

The use of weapons in summer. (Mil-Woch—Oct 1936)

The German Army maneuvers, 1936. [See Section 2]

What price automatic? (A Ord—Nov-Dec 1936)

German small arms and ammunition. (A Ord—Jan-Feb 1937)

Weapon and target. (A Quar—Jan 1937)

Development of cavalry weapons, past, present and future. (Cav Jour—Nov-Dec 1936)

WELLINGTON, Arthur Wellesley, 1st Duke of Wellington (1769-1852)

The Duke of Wellington. (Inf Jour—Nov-Dec 1936)

WITHDRAWAL

The delay in successive positions. (Mil-Woch—11 Oct 1936)

Withdrawal of the German 113th Division behind the Marne on 19-20 July 1918. [See Section 2]

Canvas model or sand table demonstration. (Cav Jour—Jan 1937)

